REPORT

OF THE

DIRECTOR OF THE MINT

UPON THE

PRODUCTION

OF THE

PRECIOUS METALS IN THE UNITED STATES

DURING THE

CALENDAR YEAR 1896.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1898.

TREASURY DEPARTMENT,
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Director of the Mint.

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LETTER OF TRANSMITTAL.

TREASURY DEPARTMENT,
BUREAU OF THE MINT,
Washington, D. C., December 23, 1897.

SIR: I have the honor to hand you herewith my report upon the production of gold and silver in the United States for the calendar year 1896, together with that of other countries, compiled from official information furnished by foreign Governments and other reliable sources. The statistics of the output of the precious metals in the United States and foreign countries compiled by this Bureau are looked upon not only in America, but in Europe as well, as the most authentic published. In view of this fact unusual care has been taken in the preparation of the data relating to the world's yield of gold and silver in 1896.

Respectfully, yours,

R. E. PRESTON,
Director of the Mint.

To the Honorable SECRETARY OF THE TREASURY.

PART I.

PRODUCTION, EMPLOYMENT, AND MOVEMENT OF GOLD AND SILVER IN THE UNITED STATES, AND SURVEY OF THE WORLD'S PRODUCTION OF GOLD AND SILVER IN 1896.

GENERAL REPORT.

PRODUCTION OF GOLD AND SILVER IN THE UNITED STATES, CALENDAR YEAR 1896.

The United States maintained her position during the calendar year 1896 as the leading nation of the world in the production of both gold and silver. The approximate yield of the gold mines of the United States for 1896 was 2,568,132 ounces (or 79,880 kilograms) fine, of the value of $53,088,000, being an increase of $6,478,000 over the value of the gold output of the country in 1895 and of $13,588,000 over 1894. The gold product of the United States for 1896 was larger than for any single year since 1866, and was greater than that of 1883 by 57 per cent. It constituted about 26 per cent of the total estimated gold product of the world for the year, exceeding that of the Australian colonies by $7,906,100; that of Africa by $8,680,400, and that of Russia by $31,552,200.

The increase in the gold output came from Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon, South Dakota, Utah, and Washington. Colorado contributed to the increased product $1,605,900; South Dakota $1,100,300, and Nevada $916,100. With the exception of Georgia, where there was a small increase, the output of the States of the South Appalachian Range for 1896 decreased as compared with the output for 1895.

The approximate production of the gold mines of the United States can readily be determined. The coinage of gold by the mints of the United States being gratuitous, most of the gold produced is sent to these institutions either in the form of crude bullion, direct from the mines, or by private refineries in the form of fine bars, while some is exported in ores and copper matte, the value of which is ascertained; hence it is only the amount contained in nuggets or other specimens, the value of which is inconsiderable, that does not enter into the calculation of the gold product as determined by the Bureau of the Mint.

The calculation of the gold product of the United States is made by the Bureau of the Mint in two different ways, either of which gives a result that is a very close approximation to the actual yield. The mean of these two calculations is adopted as the estimate of the gold product of the United States for the year in question. The first method will be understood from the following statement of facts: The gold produced from the mines of the country in any year goes partly to the private smelting and refining establishments of the United States to be refined, partly to the mints and assay offices, while a part

is exported in gold ores and argentiferous and copper matte for reduction in other countries. As these items are very closely ascertained, their total constitutes the gold product of the country for the year.

These several items are shown in the following statement, which exhibits the gold product of the United States for the calendar year 1896:

APPROXIMATE GOLD PRODUCT OF THE MINES OF THE UNITED STATES DURING THE CALENDAR YEAR 1896.

Items reported for 1896.	Fine ounces.
Domestic product in fine gold bars reported by private refineries	1,720,755
Unrefined gold of domestic production deposited at the mints and assay offices	838,045
Domestic gold contained in ores, copper matte, etc., exported for reduction	10,140
Total	2,568,940

To verify the result reached by the above method, it has been the custom of the Bureau of the Mint to submit in this series of reports a second table, showing the disposition of the domestic gold bullion and auriferous ores produced. The following is their disposition: Part of the domestic gold bullion is deposited at the mints and assay offices for conversion into coin; part is exported; part is sold by private refineries to manufacturers and jewelers for use in the industrial arts, while some gold in domestic ores and copper matte is exported.

When fine gold bars, the product of private refineries, are deposited at the mints and assay offices and classified as of "domestic production," the value of the foreign bullion contained in such bars is deducted in this calculation.

The disposition of the gold product of the mines of the United States is exhibited in the following table:

APPROXIMATE DISPOSITION OF THE GOLD PRODUCT OF THE MINES OF THE UNITED STATES DURING THE CALENDAR YEAR 1896.

Disposition.	Fine ounces.
Bullion deposited at the mints and assay offices classified as of domestic production	2,812,101
Less product of 1895 deposited in mints and assay offices in 1896, as per information furnished by private refineries	11,425
Net product of 1896 deposited at mints and assay offices	2,800,676
Domestic bullion, other than United States mint or assay office bars, exported from the United States	5,970
Domestic gold in ores, copper mattes, etc., exported	10,140
Bullion of domestic production reported by private refineries in the United States as having been made into bars for manufacturers and jewelers for use in the industrial arts	30,095
Total	2,846,881
Deduct foreign bullion reported to the Bureau of the Mint by private refineries in the United States as contained in their product of fine gold bars deposited at the mints and assay offices or entered at the custom-houses for exportation as of domestic production but derived from foreign ores	279,534
Net total	2,567,347

The result reached in either of the above tables is a close approximation to the actual gold production by the mines of the United States. The mean, or 2,568,132 ounces (79,880 kilograms), fine, of the value of $53,088,000, is taken as the estimate of the gold product of the United States in 1896.

The gold product of the United States for the calendar years 1895 and 1896, and the States and Territories in which there was an increase or decrease in the latter year, is shown in the following table:

TABLE SHOWING THE PRODUCT OF GOLD IN THE SEVERAL STATES AND TERRITORIES IN 1895 AND 1896 AND THE INCREASE OR DECREASE OF THE PRODUCTION OF EACH IN THE LATTER YEAR.

State or Territory.	Value.			
	1895.	1896.	Increase.	Decrease.
Alaska	$1,615,300	$2,055,700	$440,400	.....
Arizona	1,965,300	2,604,200	638,900	.....
California	14,928,600	15,235,900	307,300	.....
Colorado	13,305,100	14,911,000	1,605,900	.....
Georgia	128,000	151,000	23,000	.....
Idaho	1,779,600	2,155,300	375,700	.....
Michigan	42,900	37,200	.....	$5,700
Montana	4,101,400	4,324,700	223,300	.....
Nevada	1,552,200	2,468,300	916,100	.....
New Mexico	492,200	475,800	.....	16,400
North Carolina	54,200	44,300	.....	9,900
Oregon	888,300	1,251,000	362,700	.....
South Carolina	128,400	63,300	.....	65,100
South Dakota	3,869,500	4,969,800	1,100,300	.....
Texas	.....	8,000	8,000	.....
Utah	1,373,000	1,899,900	526,900	.....
Washington	351,000	405,700	54,700	.....
Alabama, Connecticut, Iowa, Maryland, Minnesota, Nebraska, Tennessee, Vermont, Virginia, Wyoming	35,000	26,900	.....	8,100
Total	46,610,000	53,088,000	6,583,200	105,200
Net increase	.....	.....	6,478,000	.....

PRODUCTION OF SILVER IN THE UNITED STATES.

In estimating the silver product of the United States the method employed is the same as that used in calculating the gold product.

The items exhibiting the silver product of the mines of the United States during the calendar year 1896 are set forth in the following table:

APPROXIMATE SILVER PRODUCT OF THE MINES OF THE UNITED STATES DURING THE CALENDAR YEAR 1896.

Items reported for 1896.	Fine ounces.
Domestic product in fine silver bars reported by private refineries	55,761,510
Unrefined silver of domestic production deposited at the mints and assay offices	479,407
Domestic silver contained in ores, copper matte, etc., exported for reduction	2,540,670
Total	58,781,587

The disposition of the silver product of the mines of the United States is exhibited in the following table:

APPROXIMATE DISPOSITION OF THE SILVER PRODUCT OF THE MINES OF THE UNITED STATES DURING THE CALENDAR YEAR 1896.

Disposition.	Fine ounces.
Bullion deposited at the mints and assay offices classified as of domestic production	3,891,472
Domestic bullion, other than United States mint or assay office bars, exported from the United States (custom-house rating at commercial value $56,112,697, corresponding, at average price of silver during the year, to $0.67 per fine ounce)	83,750,300
Domestic silver in ores, copper matte, etc., exported	2,540,670
Bullion of domestic production reported by private refineries in the United States as having been made into bars for manufacturers and jewelers for use in the industrial arts	2,616,922
Increase in the approximate stock of silver bars, exclusive of any bars bearing the stamp of a United States mint or assay office, in the United States, held by the Mercantile Safe Deposit Company and other institutions, at the close of the calendar year 1896, according to information furnished the Bureau of the Mint	287,026
Total	93,086,390
Deduct foreign bullion reported to the Bureau of the Mint by private refineries in the United States as contained in their product of fine silver bars deposited at the mints and assay offices or entered at the custom-houses for exportation as of domestic production but derived from foreign ores	34,198,373
Net total	58,888,017

The mean of these two results being, in round numbers, about 58,834,800 ounces, fine, of the coining value of $76,069,236 and the commercial value—at the average value of an ounce fine during the year, viz, $0.674—of $39,654,655, represents the product of silver in the United States in 1896. The product in 1895 was 55,727,000 ounces.

The increase of the output of silver in the United States in 1896 over that of 1895 was therefore 3,107,800 ounces, of the coining value of $4,018,236.

The production of silver in the United States reached its maximum in 1892, when it amounted to 63,500,000 ounces, fine. It declined in 1893 to 60,000,000 ounces, and in 1894 to 49,500,000 ounces; in 1895 it reached 55,727,000 ounces, and in 1896 continued on its upward course, reaching a figure which was exceeded only in the years, 1892 and 1893.

The following table exhibits the total silver output of the United States in 1895 and 1896 and in what States and Territories there was an increase or decrease:

TABLE SHOWING THE PRODUCT OF SILVER IN THE SEVERAL STATES AND TERRITORIES IN 1895 AND 1896, AND THE INCREASE OR DECREASE OF THE PRODUCTION OF EACH, IN THE LATTER YEAR.

State or Territory.	1895.	1896.	Increase.	Decrease.
	Ounces, fine.	*Ounces, fine.*	*Ounces, fine.*	*Ounces, fine.*
Alaska	67,200	145,300	78,100	.....
Arizona	986,900	1,913,000	926,100	.....
California	653,700	600,600	.....	53,100
Colorado	23,398,500	22,573,000	.....	825,500
Georgia	400	600	200	.....
Idaho	3,110,600	5,149,900	2,039,300	.....
Michigan	37,300	59,000	21,700	.....
Montana	17,569,100	16,737,500	.....	831,600
Nevada	956,200	1,048,700	92,500	.....
New Mexico	694,800	687,800	.....	7,000
North Carolina	400	500	100	.....
Oregon	51,000	61.100	10,100	.....
South Carolina	400	300	.....	100
South Dakota	159,300	229,500	70,200	.....
Texas	450,000	525,400	75,400	.....
Utah	7,468,100	8,827,600	1,359,500	.....
Washington	122,700	274,900	152,200	.....
Alabama, Connecticut, Iowa, Maryland, Minnesota, Nebraska, Tennessee, Vermont, Virginia, Wyoming	400	100	.....	300
Total	55,727,000	58,834,800	4,825,400	1,717,600
Net increase	.....	.....	3,107,800	.....

In another part of this volume will be found the reports of the special agents of the Bureau of the Mint on the production of the precious metals in the several States and Territories during the calendar year 1896. The aggregate output of gold and silver from the mines of the United States summarized from these reports does not agree with the result arrived at by the above calculation. The reason of this is plain. The latter represents the amount of the finished marketable product of the

two metals obtained during the year, while the figures given by the agents are based, for the most part, on their own estimates or the estimates of mine owners before the ore extracted from their properties has been reduced to the form of salable bullion.

The following table of the production of the precious metals in the several States and Territories is compiled from the reports of the agents of the Bureau:

PRODUCT OF GOLD AND SILVER, REPORTED BY MINT OFFICERS AND AGENTS FOR THE INDIVIDUAL STATES AND TERRITORIES, FOR THE CALENDAR YEAR 1896.

State or Territory.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Alabama	314	$6,491	158	$204	$6,695
Alaska	138,416	2,861,307	35,423	45,799	2,907,106
Arizona	129,979	2,686,897	963,513	1,245,754	3,932,651
California	831,158	17,181,563	326,749	422,464	17,604,027
Colorado	730,992	15,110,960	21,547,228	27,859,042	42,970,002
Georgia	7,222	149,292	613	793	150,085
Idaho	112,409	2,323,700	5,007,940	6,474,912	8,798,612
Maryland	50	1,034	2	3	1,037
Michigan	1,801	37,230	58,974	76,249	113,479
Montana	211,915	4,380,672	15,720,022	20,324,877	24,705,549
Nevada	145,103	2,999,542	781,176	1,010,006	4,009,548
New Mexico	39,422	814,920	533,500	689,778	1,504,698
North Carolina	2,486	51,390	515	666	52,056
Oregon	62,450	1,290,964	55,541	71,811	1,362,775
South Carolina	4,853	100,320	303	391	100,711
South Dakota	244,705	5,058,501	178,942	231,359	5,289,860
Tennessee	28	579	2	3	582
Texas	389	8,041	525,411	679,319	687,360
Utah	92,044	1,902,718	8,250,233	10,666,968	12,569,686
Virginia	215	4,444	17	22	4,466
Washington	19,132	395,490	233,407	301,779	697,269
Wyoming	58	1,200	.....	.....	1,200
Total	2,775,141	57,367,255	54,219,669	70,102,199	127,469,454

APPROXIMATE DISTRIBUTION BY PRODUCING STATES AND TERRITORIES, OF THE PRODUCT OF GOLD AND SILVER IN THE UNITED STATES FOR THE CALENDAR YEAR 1896, AS ESTIMATED BY THE DIRECTOR OF THE MINT.

State or Territory.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Alabama	275	$5,700	.....	.....	5,700
Alaska	99,444	2,055,700	145,300	$187,863	2,243,563
Arizona	125,978	2,604,200	1,913,000	2,473,373	5,077,573
California	737,036	15,235,900	600,600	776,533	16,012,433
Colorado	721,320	14,911,000	22,573,000	29,185,293	44,096,293
Georgia	7,305	151,000	600	776	151,776
Idaho	104,263	2,155,300	5,149,900	6,658,457	8,813,757
Iowa	48	1,000	.....	.....	1,000
Maryland	15	300	.....	.....	300

APPROXIMATE DISTRIBUTION BY PRODUCING STATES AND TERRITORIES, OF THE PRODUCT OF GOLD AND SILVER IN THE UNITED STATES FOR THE CALENDAR YEAR 1896, AS ESTIMATED BY THE DIRECTOR OF THE MINT—Continued.

State or Territory.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Michigan	1,800	$37,200	59,000	$76,283	113,483
Minnesota	39	800	.....	.....	800
Montana	209,207	4,324,700	16,737,500	21,640,404	25,965,104
Nevada	119,404	2,468,300	1,048,700	1,355,895	3,824,195
New Mexico	23,017	475,800	687,800	889,277	1,365,077
North Carolina	2,143	44,300	500	646	44,946
Oregon	60,517	1,251,000	61,100	78,998	1,329,998
South Carolina	3,062	63,300	300	388	63,688
South Dakota	240,414	4,969,800	229,500	296,727	5,266,527
Tennessee	15	300	.....	.....	300
Texas	387	8,000	525,400	679,305	687,305
Utah	91,908	1,899,900	8,827,600	11,413,463	13,313,363
Vermont	48	1,000	.....	.....	1,000
Virginia	169	3,500	.....	.....	3,500
Washington	19,626	405,700	274,900	355,426	761,126
Wyoming	692	14,300	100	129	14,429
Total	2,568,132	53,088,000	58,834,800	76,069,236	129,157,236

The following table shows the production of gold and silver from the mines of the United States in the years 1860 to 1896:

(The silver product is given at its commercial value, reckoned at the average market price of silver each year, as well as its coining value in United States dollars.)

PRODUCT OF GOLD AND SILVER FROM MINES IN THE UNITED STATES, 1860–1896.

[The estimate for 1860–1872 is by R. W. Raymond, commissioner, and since 1872 by the Bureau of the Mint.]

Calendar year.	Gold.		Silver.		
	Fine ounces.	Value.	Fine ounces.	Commercial value.	Coining value.
1860	2,225,250	$46,000,000	116,015	$157,000	$150,000
1861	2,080,125	43,000,000	1,546,875	2,062,000	2,000,000
1862	1,896,300	39,200,000	3,480,469	4,685,000	4,500,000
1863	1,935,000	40,000,000	6,574,219	8,842,000	8,500,000
1864	2,230,088	46,100,000	8,507,812	11,443,000	11,000,000
1865	2,574,759	53,225,000	8,701,171	11,642,000	11,250,000
1866	2,588,063	53,500,000	7,734,375	10,356,000	10,000,000
1867	2,502,197	51,725,000	10,441,406	13,866,000	13,500,000
1868	2,322,000	48,000,000	9,281,250	12,307,000	12,000,000
1869	2,394,563	49,500,000	9,281,250	12,298,000	12,000,000
1870	2,418,750	50,000,000	12,375,000	16,734,000	16,000,000
1871	2,104,313	43,500,000	17,789,062	23,578,000	23,000,000
1872	1,741,500	36,000,000	22,236,328	29,396,000	28,750,000
Total	29,012,908	599,750,000	118,065,232	157,366,000	152,650,000
1873	1,741,500	36,000,000	27,650,000	35,890,000	35,750,000
1874	1,620,563	33,500,000	28,849,000	36,869,000	37,300,000

PRODUCT OF GOLD AND SILVER FROM MINES IN THE UNITED STATES, 1860–1896—Continued.

Calendar year.	Gold.		Silver.		
	Fine ounces.	Value.	Fine ounces.	Commercial value.	Coining value.
1875	1,615,725	$33,400,000	24,518,000	$30,549,000	$31,700,000
1876	1,930,162	39,900,000	30,009,000	34,690,000	38,800,000
1877	2,268,788	46,900,000	30,783,000	36,970,000	39,800,000
1878	2,476,800	51,200,000	34,960,000	40,270,000	45,200,000
1879	1,881,787	38,900,000	31,550,000	35,430,000	40,800,000
1880	1,741,500	36,000,000	30,320,000	34,720,000	39,200,000
1881	1,678,612	34,700,000	33,260,000	37,850,000	43,000,000
1882	1,572,187	32,500,000	36,200,000	41,120,000	46,800,000
1883	1,451,250	30,000,000	35,730,000	39,660,000	46,200,000
1884	1,489,950	30,800,000	37,800,000	42,070,000	48,800,000
1885	1,538,325	31,800,000	39,910,000	42,500,000	51,600,000
1886	1,693,125	35,000,000	39,440,000	39,230,000	51,000,000
1887	1,596,375	33,000,000	41,260,000	40,410,000	53,350,000
1888	1,604,841	33,175,000	45,780,000	43,020,000	59,195,000
1889	1,587,000	32,800,000	50,000,000	46,750,000	64,646,000
1890	1,588,880	32,845,000	54,500,000	57,225,000	70,465,000
1891	1,604,840	33,175,000	58,330,000	57,630,000	75,417,000
1892	1,596,375	33,000,000	63,500,000	55,563,000	82,101,000
1893	1,739,323	35,955,000	60,000,000	46,800,000	77,576,000
1894	1,910,813	39,500,000	49,500,000	31,422,000	64,000,000
1895	2,254,760	46,610,000	55,727,000	36,445,000	72,051,000
1896	2,568,132	53,088,000	58,835,000	39,655,000	76,069,000
Total	42,751,613	883,748,000	998,411,000	982,738,000	1,290,820,000
Grand total	71,764,521	1,483,498,000	1,116,476,232	1,140,104,000	1,443,470,000

Tables showing the product of gold and silver from mines of the United States since 1792 will be found in the Appendix.

HISTORY OF THE METHODS FOLLOWED IN COLLECTION OF THE STATISTICS OF THE PRODUCTION OF THE PRECIOUS METALS IN THE UNITED STATES.

The Missouri River divides the auriferous regions of the United States into two great geographical domains, an eastern and a western, the former almost, if not entirely, coincident with the Appalachian Range. Previous to 1848, the year in which the Californian gold beds were first worked, all the gold produced in the United States came from veins or washings in the States embraced in the Appalachian Range. Since that year all but a comparatively insignificant portion of the gold mined in the Union has been produced west of the Missouri River.

Until the Californian gold beds began to be worked, scarcely any country of equal area had yielded as little of the precious metals as the country now known as the United States. Since that year it has, by the rapid development of its gold and silver resources, far outdistanced all competitors as a producer of gold and silver. Its output

of both metals has for a long series of years been almost uninterruptedly greater than that of any other country.

The first faint traces of the production of gold in the United States are to be found about the close of the last century in Virginia and North Carolina. The production became somewhat larger in the twenties and thirties of the present century, when gold beds were discovered in the States of Georgia, South Carolina, Tennessee, and Alabama, and when the gold obtained from the mines of these States was sent to the mints and coined.

During the fifty-three years between 1792 and 1845 the average annual gold product of the United States is estimated by Mr. Rossiter W. Raymond at $410,000.

Jacob, in his Historical Inquiry into the Production and Consumption of the Precious Metals, published in London in 1831, devotes only two short paragraphs (Vol. II, pp. 266, 267) to the production of gold and silver in the United States, and it is evident from his language that he deemed it scarcely worthy of mention. He says:

> It may not be improper to notice a kind of mania on the subject of gold mines, which at present (1831) prevails in some parts of the United States of America, although it is of too recent a date to have any influence on the subject of this inquiry. As far as it extends, it may be compared with the excitement created in Ireland a few years ago by the discovery of some small portions of gold in the mountains of Wicklow.
>
> Some gold had been found in North Carolina as early as 1824; the amount was then only $6,000; in 1825, it increased to $17,000; in 1826, it rose to $20,000; in 1827, to $21,000; in 1828, to $46,000, and in 1829 to $128,000. Besides the attempts made in North Carolina in the year 1829, the same spirit of searching was extended to Virginia, where it obtained $2,500, and to South Carolina, which yielded $3,500. This tendency has extended southward to Georgia, where a mine is said to have been discovered near Gainesville, in Hall County. It is called a ridge mine, and the rocks, when pounded, produce gold in a greater or less quantity. On the 21st September, 1830, seven hands procured 205 pennyweights of pure gold, equal to $180; but this appears to have been much more than the average produce at a day's labor.

Even this meager account of the production of gold in the United States in the first decades of this century is misleading.

Gold was discovered much earlier in Virginia and North Carolina than the dates given by Jacob.

According to J. D. Whitney, the production of gold in the years 1804 to 1850, inclusive, in the several States of the south Appalachian Range, and their total production in the periods given below, was:

State.	Value by States.	Period.	Value by periods.
Virginia	$1,198,600	1804–1823	$47,000
North Carolina	6,842,900	1824–1830	715,000
South Carolina	818,100	1831–1840	6,695,000
Georgia	6,048,900	1841–1850	7,715,300
Tennessee and Alabama	263,800	.....	.....
Total	15,172,300	.....	15,172,300

No serious endeavor seems to have been made until after the discovery of gold in California to ascertain and record the annual output of the precious metals in the United States. This may have been due, in part at least, to the small amount of the product previous to that time. The yield of gold was small and that of silver practically *nil*. Even for a great many years after the finding of gold on the Pacific Slope the statistics of its production and the methods of their collection were exceedingly unsatisfactory. Statisticians were then as intelligent and painstaking as they now are; but the difficulties they had to overcome to make anything like an accurate estimate of the yield of the gold mines, scattered over a vast extent of territory, were tenfold greater than they are to-day. The relative imperfection of the statistics of early days is not due to the incapacity of their compilers, but to conditions, physical and moral, over which they had no control, and which have been removed only by the general progress of civilization.

The estimation or calculation of the annual output of the precious metals is at best a task beset with difficulties, and were it not for the important part they play in the discussion of a great many economic questions, especially in questions relating to money and the standard, it is doubtful if so much time and labor would be devoted to them. As Dr. Soetbeer says:

> In researches on the statistics of the production of the precious metals there are two important points which must be always borne in mind, and which become more apparent the more zealously and cautiously such researches are carried on.
>
> In the first place, the investigator becomes more and more impressed with the difficulties in the way of reaching reliable numerical results in this branch of statistics. He becomes more and more convinced that his calculations, even after the expenditure of much labor and when made with the utmost conscientiousness, bear the character of uncertainty and are more or less arbitrary; that in many instances the best he can do is to obtain only risky, approximate estimates with a very wide margin for error, and that when he has to prepare statistical totals of the production of the precious metals in years long past he must be satisfied in great part with conjectures and probabilities. When one considers the uncertainty and incompleteness of the statistical results to be reached, as well as the difficulties encountered in collecting and sifting the materials which in the most favorable case can yield only approximate estimates, it seems almost inconceivable that so many investigators should still devote themselves, at the expenditure of so much time and trouble, to tasks of this nature.
>
> These discouraging and deterrent considerations are offset by one no less important, which urges statisticians on to undertake estimates of the production of the precious metals notwithstanding the uncertainty and difficulty that attend them, and to correct and complete estimates of the kind previously made. This latter consideration is based on the universal, practical, and theoretical interest involved in the attempts at a thorough statistical determination of the production and consumption of gold and silver.
>
> Whenever and wherever there is a question of money and wealth, the need is felt of numerical data, even when such data are only approximations and are given with great reservation. General indications do not suffice.

The experience of persons in the United States who have endeavored to calculate the annual output of gold and silver from the mines of the

country confirm the truth of these observations of the eminent German statistician, especially when applied to the earliest attempts made in that direction.

The history of the statistics of the production of gold and silver in the United States may be very appropriately divided into two periods, the one before and the other subsequent to the discovery of gold in California, the first ending with 1847, and the second beginning with 1848, the earliest year in which gold from California was deposited at the United States Mint or any of its branches.

The following table exhibits the deposits of domestic gold at the United States Mint and its branches previous to the discovery of gold in California. As here given, it is taken from the work of J. D. Whitney (The Metallic Wealth of the United States, described and compared with that of other Countries, Philadelphia, 1854, p. 47):

VALUE OF GOLD OF DOMESTIC PRODUCTION DEPOSITED AT THE UNITED STATES MINT AND ITS BRANCHES, FROM EACH STATE, FROM 1804 TO THE DISCOVERY OF GOLD IN CALIFORNIA.

Year.	Virginia.	North Carolina.	South Carolina.	Georgia.	Tennessee.	Alabama.	Various.	Total for each year.
1804–23	.....	$47,000	.....	.....	.....	.....	.....	$47,000
1824	.....	5,000	.....	.....	.....	.....	.....	5,000
1825	.....	17,000	.....	.....	.....	.....	.....	17,000
1826	.....	20,000	.....	.....	.....	.....	.....	20,000
1827	.....	21,000	.....	.....	.....	.....	.....	21,000
1828	.....	46,000	.....	.....	.....	.....	.....	46,000
1829	$2,500	134,000	$3,500	.....	.....	.....	.....	140,000
1830	24,000	204,000	26,000	$212,000	.....	.....	.....	466,000
1831	26,000	294,000	22,000	176,000	$1,000	.....	$1,000	520,000
1832	34,000	458,000	45,000	140,000	1,000	.....	.....	678,000
1833	104,000	475,000	66,000	216,000	7,000	.....	.....	868,000
1834	62,000	380,000	38,000	415,000	3,000	.....	.....	898,000
1835	60,400	263,500	42,400	319,900	100	.....	12,200	698,500
1836	62,000	148,100	55,200	201,400	300	.....	.....	467,000
1837	52,100	116,900	29,400	83,600	.....	.....	.....	282,000
1838	55,000							435,100
1839	57,600							404,208
1840	38,995							426,185
1841	25,736							542,117
1842	42,163							777,097
1843	48,148	2,898,595	406,040	3,582,033	50,446	155,107	24,650	1,045,445
1844	40,595							967,200
1845	86,783							1,019,281
1846	55,538							1,129,357
1847	67,736							889,085

The above figures probably represent only a part of the gold product of the United States in the years named. To make it a complete representation of the gold output of the country from 1804 to 1847 it would be necessary to add to them the quantities exported and those employed in the industrial arts without having been deposited at the mints. These two items, however, can not be determined. There is no official

record of the exports of gold from the United States previous to 1864. In the official returns and statements of imports and exports, and of foreign exports prior to the year 1821, the precious metals were not distinguished from articles of merchandise.

In the statements of domestic exports, the precious metals were first distinguished from other commodities in the fiscal year ended September 30, 1826, but the coin was not then distinguished from bullion nor gold from silver. In the fiscal year ended June, 1855, exports of gold production in the United States were first distinguished from those of coin, and in the fiscal year ended June 30, 1864, exports of silver were also distinguished from those of gold, which distinction has been continued to the present time.

It may be assumed, however, that prior to 1848 very little domestic gold bullion was exported, and that all or nearly all of it was deposited for coinage at the mints, at which institutions the coinage of gold during the years named above far exceeded the deposits of domestic gold bullion. The following exhibit is evidence of this:

GOLD COINAGE OF THE UNITED STATES AND THE DEPOSITS OF DOMESTIC GOLD BULLION AT THE MINTS OF THE UNITED STATES IN THE YEARS 1804 TO 1847.

Year.	Deposits of domestic gold at the mints.	Gold coinage.	Year.	Deposits of domestic gold at the mints.	Gold coinage.
1804–1823	$47,000	$5,663,725.00	1836	$467,000	$4,135,700.00
1824	5,000	93,200.00	1837	282,000	1,148,305.00
1825	17,000	156,385.00	1838	435,100	1,809,765.00
1826	20,000	92,245.00	1839	404,208	1,376,847.50
1827	21,000	131,565.00	1840	426,185	1,675,482.50
1828	46,000	140,145.00	1841	542,117	1,091,857.50
1829	140,000	295,717.50	1842	777,097	1,829,407.50
1830	466,000	643,105.00	1843	1,045,445	8,108,797.50
1831	520,000	714,270.00	1844	967,200	5,427,670.00
1832	678,000	798,435.00	1845	1,019,281	3,756,447.50
1833	868,000	978,550.00	1846	1,129,357	4,034,177.50
1834	898,000	3,954,270.00	1847	889,085	20,202,325.00
1835	698,500	2,186,175.00			

Thus the coinage was sufficient not only to absorb the domestic production of gold, but also much of the imports of that metal, whether in the form of coin or bullion. What gold was employed in the arts during the early period there is absolutely no record of.

The basis of most of the early estimates of the production of gold in the United States after 1847, consisted mainly of the records of the exports of that metal from San Francisco, and the coinages and assays at the mint there, but especially the books of Wells, Fargo & Co.'s Express, which has long done the work of the transportation of the precious metals produced west of the Missouri, and has kept an accurate account of the value of the amounts carried.

The use of the information furnished by these records left, however, ample room for estimates by private persons based merely on probability. A considerable portion of the gold mined by the thousands of individual gold diggers was exported by the owners themselves or by their acquaintances, without appearing in the export records of San Francisco or in the books of the express company. Besides, the value assigned the exports of gold usually included that of the silver also. This is especially true of the period when the production of silver was still comparatively unimportant, while in a great many tables constructed thereafter a part of the gold produced was embraced in the data of the output of silver, especially in the figures of the production of gold and silver in Nevada. Nor must it be forgotten that in the amounts of gold given in the records above mentioned, gold that was originally produced in British Columbia, or in the mining districts of Mexico, or in the neighborhood of California, and which, therefore, did not really belong to the production of the United States, was included with that of California. Again, in the tables of the transportation companies the same amount was sometimes inserted twice. On the whole, the margin of error in the estimates of which we are speaking must not be made too narrow. Besides, the temptation to overestimate the production was doubtless greater than to underestimate it.

As an example of these early estimates, a table is given below of the export of the precious metals from San Francisco from 1848 to 1863, as published in the commercial statistics of that city, copied from the custom-house records, and as cited both by Blake, in his work on the Production of the Precious Metals, and by the German, Richthofen, in his work on the Precious Metal Production of California. For the years 1848 to 1859 an addition was made in this table to the declared amounts, because of the acknowledged incompleteness of the official records. On the other hand, for the years 1861, 1862, and 1863 a deduction was made of, respectively, $1,500,000, $6,000,000, and $13,000,000, on account of the silver contained in the amounts manifested, and whose export by the way of San Francisco became quite important after 1861. The table referred to is as follows:

Year.	Declared gold export.	Estimated actual gold export.	Year.	Declared gold export.	Estimated actual gold export.
1848	$66,000,000	$10,000,000	1856	50,697,434	55,000,000
1849		40,000,000	1857	48,976,692	55,000,000
1850		50,000,000	1858	47,548,026	50,000,000
1851 *a*	11,497,000	55,000,000	1859	47,640,462	50,000,000
1851	34,960,895		1860	42,325,916	42,325,916
1852	45,779,000	60,000,000	1861	40,676,758	39,176,758
1853	54,965,000	65,000,000	1862	42,561,761	36,061,761
1854	52,045,633	60,000,000	1863	46,071,920	33,071,920
1855	45,161,731	55,000,000			

a To the 1st of May.

Richthofen, whose work was published in 1864, explained this table by the following remarks:

The gold production of California for recent years may be stated with some accuracy, but for earlier years only approximately. The bases of the statistical data are the shipments made by the steamers which leave for Panama three times a month, and steamers bound for China and other places. These figures representing values, show, for recent years, nearly the entire export of gold coin and gold bars, but not the gold remaining in the country. The amount of the latter is not inconsiderable, as it is well known that the greenback currency of the United States finds no favor in California, and payments are accepted in gold only. These figures also leave out of consideration the value of the silver contained in the gold bars. As, however, the fineness of the gold averages 0.850, the silver, because of its insignificance, may be neglected. Of much greater importance is the fact that large sums are exported by private individuals, and were exported in earlier years in much larger sums, as gold dust. The entire exportation of gold was made in this way in the early years of California's gold production.

In the above table the value of the gold is given, first according to the official tables of export, and then according to estimates in which the sums exported by private individuals are included. Up to 1860 the exports of gold consisted exclusively of gold coin and gold bars. In order to obtain correct values for the three years, 1861–1863, the gold contained in the silver bars exported in that time must be added, and the amount of such gold was considerable. It has, however, been left out of consideration in the above table, in order that a clear idea may be formed of the amounts derived from the gold mines proper and from the gold washings.

Richthofen (writing in 1864) remarks further that recently there was a decline in the production of California gold, which was all the more surprising when it was recalled that in the earliest years the gold washings of California alone yielded the entire product, while in later years the gold mines of the country and the gold washings of Idaho, Arizona, and British Columbia had contributed thereto. The decrease in the amount of gold from the gold washings would have been still greater if the increase of the Chinese population had not worked against it. The white man was scarcely satisfied with $4 per day. The Chinaman was content with $1 and less, and could, therefore, work over again with good results the gold-sand which had previously been washed.

The above account of Richthofen's estimate is also taken from Soetbeer, who continues:

"Jacoby (Archiv für wissenschaftliche Kunde von Russland, B. XXIV) says that Richthofen's estimates are too low. Diminished production should not be inferred from diminished exports; the large increase of the other productions and exports of California naturally caused a much larger amount of the output of gold to remain in the country than formerly. Nor does it seem right that no addition was made to the production of the last three years (1861–1863) on account of undeclared exports by passengers. The gold product of California and neighboring countries in the years 1856 to 1862 should, according to Jacoby, be estimated at an average of from $75,000,000 to $80,000,000.

W. P. Blake, who continued the above table of the exports of the precious metals from San Francisco in the years 1864 to 1867, as follows:

1864	$56,707,201
1865	45,308,227
1866	44,364,393
1867	41,676,292

remarks, that doubtless a large amount of precious metals in coin and bullion had been carried out of San Francisco by passengers. The amount had been variously estimated. Commissioner Browne had assumed it to be $200,000,000 up to 1865, which amount is probably too high. It was usually calculated that an addition of 10 per cent should be made to the declared shipments from the interior of the State for the gold carried away by the diggers themselves and which did not figure in the books of the express company. This addition Blake thinks must also be considered too large, for these amounts would be greater than the shipped sums not manifested."

What has been said above affords a fair idea of how the estimates of the production of the precious metals in the United States were formed until the Government in 1866 appointed a commissioner of mining statistics, who was required to make annually a comprehensive report to the Secretary of the Treasury. These reports were laid before Congress and then printed.

That the position of these gentlemen was an onerous one, involving a vast amount of patience, skill, and labor, will appear from the copious extracts given below from their published reports. The citations are given in full rather than in condensed form, and in the words of the Commissioners themselves rather than of the writer, because they thus naturally carry greater weight and impress more strongly the mind of those interested in these statistics with the value of the services rendered by these devoted officials and with the progress that has gradually been made in the simplification and accuracy of the processes of the calculation of the output of the precious metals in the United States.

During the first two years Mr. J. Ross Browne filled this office, and after him Mr. Rossiter W. Raymond, who in the year 1877 published his eighth and last report, as well as the last report of the Commissioner of Mining Statistics, the office having ceased to exist at the end of Mr. Raymond's term. This last report was for the year 1875.

"These reports," says Dr. Soetbeer, "contain an extraordinary amount of detail on the individual mining enterprises of the United States, and also technic information of every description. Mr. Raymond visited most of the mines in the different States and Territories, and placed himself in communication with a large number of persons who furnished him with useful information and by whom he was nearly always cordially received.

"The information supplied by the express companies was especially useful to him, while, on the other hand, the circular letters containing

interrogatories, which were sent out to the different mining companies were of little use.

"Complete and accurate statistical data were furnished by a very large number of mining companies, but it is easy to recognize in his reports Mr. Raymond's reluctance to give numerical data of the total production of the precious metals as the result of his own special investigations, although the public was most anxious for such data. But this very reluctance of the author to make estimates of the total production because of the insufficiency of the material, inspires all the greater confidence in his own special data. When Mr. Raymond, as he occasionally does, but with the utmost reservation, makes estimates of totals, they rightly claim authority over all others, so long as there is no definite reason given for material deviation from them."

The difficulties that confronted the first special commissioner, Mr. J. Ross Browne, in his endeavors to ascertain the product of gold and silver in the States west of the Missouri, may be judged from the following extract from his first report:

One of the difficulties already experienced in the collection of mining statistics on this coast is the disinclination of parties interested to expose the secrets of their business. Either the business is not remunerative and they desire to encourage further investments by false representations or by withholding the truth, or, if unusually successful, they may consider it to their interest, in view of further purchases, arrangements, or contracts, to avoid giving publicity to the facts. I am inclined to believe, however, that the advantages of fair and truthful statements in the encouragement of immigration, the reduction of the cost of labor, the promotion of confidence in mining enterprises, and the establishment of a more uniform system of laws will soon become apparent. Indeed, the difficulty to which I refer is not so general even now as might be supposed. I have found mining companies doing a steady and reliable business nearly always disposed to furnish the desired information. The cases of refusal are exceptional, and there is usually a cause for it, well understood by persons familiar with mining enterprises.

Another difficulty, which, however, will not exist to so great an extent hereafter, has been the conflicting character of statements made by different parties. In many instances where the sources of information are equally reliable but where conflicting influences prevail, it is almost impossible, after the lapse of any great length of time, to get at the exact truth. Even facts, seen from different standpoints, appear differently to the most conscientious persons. In cases of this kind, where the proofs on either side are not positive, I have preferred—sometimes at the expense of prolixity—to give the different statements, especially where there is a general concurrence of testimony as to the main facts. Thus it will be seen that the amount of bullion produced on the Pacific Coast is variously estimated by the best-informed and most intelligent men. Mr. Ashburner's estimates are somewhat lower than those usually accepted by the public, but I believe they are well considered. Gold and silver are so generally blended together under the head of "bullion" that none of the express companies or bankers have hitherto kept separate records of the products of each. It would be very difficult to obtain correct returns on this point, unless the numerous assay offices and the authorities at the branch mint could furnish details of the quantity obtained by parting or by estimating the bullion passing through their establishments—the two metals are so universally alloyed with each other.

Mr. Swain, superintendent of the branch mint at San Francisco, a gentleman possessing both the means and the disposition to inform himself on this subject, esti-

mates the product of gold and silver for Oregon, California, Nevada, and Washington Territory as follows:

In 1861	$43,391,000
In 1862	49,370,000
In 1863	52,500,000
In 1864	63,450,000
In 1865	70,000,000

Well-informed parties estimate the product for 1866 as follows:

California	$25,000,000
Montana	18,000,000
Idaho	17,000,000
Colorado	17,000,000
Nevada	16,000,000
Oregon	8,000,000
Other sources	5,000,000
Total	106,000,000

Great differences of opinion, however, exist as to the accuracy of this estimate. To some it appears exaggerated, while others pronounce it far below the actual yield. The imperfect returns received for the last nine months would seem to warrant the conclusion that it is not an unreasonable estimate. For instance, the product of Oregon is assumed to be $8,000,000. Statistical tables, supposed to be worthy of credit, show a probable yield for that State of $20,000,000. In 1865 the generally accepted estimate for Oregon was $19,000,000, though that was probably above the actual product. There is good ground for believing that the result this year will be considerably above that of last year. The same may be said of the Territories of Idaho and Montana.

In like manner, the capital in circulation in California, and necessary for the transaction of business within the limits of the State, is variously estimated at from $25,000,000 to $50,000,000. It is believed that $10,000,000 is annually shipped up to the mines to defray the current expenses of mining, but there is no record of the return of this amount in the form of a circulating medium.

Assuming the estimate of the product of bullion as above given to be approximately correct, it will be seen that the States and Territories on the Pacific Slope produce annually upward of $100,000,000 of the precious metals, a quantity more than four times as great as the total product of the world less than thirty years ago. The improved processes for the extraction of these metals from their ores, made within the past two years, and the constantly increasing area over which gold and silver mines are being developed furnish strong guarantees that there will be no abatement in the product for years to come, provided Government places no impediments in the way by impolitic legislation. The recent financial panic in Europe afforded an illustration of the importance of encouraging this branch of industry. Within sixty days during that panic there was exported from San Francisco the enormous sum of $12,000,000 in gold and silver, without which, it is well known, the commercial interests of the United States would have suffered in sympathy with those of our best customers in England. The shipments of specie from San Francisco to New York during the first eight months of 1866 amounted to $27,729,010.[a]

And in his second report Mr. J. Ross Browne says:

An erroneous idea prevails that the collection of mining statistics involves original explorations and detailed personal examinations of every mine throughout the vast range of our mineral regions, with scientific and practical deductions relative to the

[a] "Mineral Resources of the United States", 1867, by Special Commissioners J. Ross Browne and James W. Taylor, pp. 8 and 9.

treatment of ores, and it is expected by some that the information obtained shall be entirely new and furnish a complete index for the purchase, sale, or working of every mine in the country. Apart from the fact that such an investigation would require the employment for many years of a large scientific force at great expense, it would be difficult even then to present statistics which had not already been made public. The same sources of information are open to all. The mining press of the country, closely connected with that interest, directly identified with its progress, in daily and familiar contact with its details, makes it a special duty to keep up the current record of cost and production, success and failure. There may be misstatement or exaggeration, but not more so on the part of the press, which is held to a certain accountability by public sentiment, than on that of individuals who may be prejudiced or irresponsible. Statements publicly made and thoroughly criticised are as likely to be correct as casual examinations made by persons visiting a special locality, unfamiliar with its growth and progress, and compelled, after all, to depend upon information derived from others. Nevertheless, it must be admitted that there are difficulties in the way of absolute accuracy.

Every miner naturally desires that his mine should be carefully examined and reported upon in detail, especially if, as in the majority of cases, it be unproductive. Without reflecting that a mere list of the unproductive mines would fill a volume, the miner is disposed to estimate the value of a report by its mention or omission of that in which he is most interested. However disposed a Government agent may be to meet the wishes of the mining community in this respect it is equally important to bear in mind that this inquiry is not designed for speculative purposes or the promotion of special or individual interests. The public desire reliable statements, and herein lies the difficulty—a spirit of exaggeration on the one hand, a demand for facts on the other. To afford satisfaction to all is impossible. I have therefore relied upon my own sense of fairness, and endeavored to present the truth impartially.

That errors may have been committed, and false statements given by interested parties, is probable, but precaution has been taken to guard against them. The selection of assistants was made with reference to their integrity and capacity. Instructions were given to them in detail, enjoining careful scrutiny and verification of every statement. The revision of their work under these precautions has occupied more than four months. There is no subject upon which greater difference of opinion exists than that of mining statistics. It is an open field in which there is room for discrepancy under any existing circumstances. No two persons rate the product of the precious metals alike. The superintendent of a mine often furnishes information which, when submitted to the board of directors, is pronounced incorrect. Representatives from the mining districts are apt to rate both population and products higher than persons who have made them special subjects of inquiry, but whose opportunities for judging may not be so favorable.

A fruitful source of error is in supposing that the ordinary channels of transportation can not be relied upon as a clue to the gross product of the mines. It is alleged that large quantities of the precious metals are carried away in the pockets of the miners. Even if this were so, it is not reasonable to suppose that the miners continue to burden themselves with their treasure after arriving at their place of destination. It must find its way into the mint, or branch mints for coinage, or the custom-house manifests for exportation. It can not be assayed without paying its internal-revenue tax. The gross yield of all the mines can be determined with approximate accuracy. It is more difficult to arrive at a subdivision when it comes to the product of each State and Territory. In California, for example, during the early days of placer mining, before the transportation of bullion by organized companies had become a business entitled to confidence, a large proportion of the gold derived from the mines was carried out of the country by private hands. There was comparatively little danger of loss. The routes to San Francisco were short, public, and protected by general interest. From that point to New York the passengers usually combined for mutual protection and the risk was inconsiderable.

It was not until the idle and the profligate began to obtain an ascendency, the business of transportation by express more firmly established, and the mines more difficult to work with profit, that the increase of risks and reduction of charges resulted in the general abandonment of this system. It doubtless prevails to a limited extent now, but the transportation of bullion by private hands in California is exceptional. It probably does not exceed 7 per cent in the aggregate, and this applies only to the routes by which it reaches San Francisco. In reference to silver, it is impossible that any considerable amount can escape notice in this way. The yield of Nevada can be determined with more accuracy than that of other States. Silver predominates in the mines, and where gold is obtained it is not in an uncombined form. When we come to Montana, Idaho, Washington, and Oregon, the greatest difficulty is experienced.

Shipments of treasure from Montana and Idaho may become incorporated with others before reaching their destination. From Montana most of the bullion goes East. Two main routes are open to examination—one by the Missouri River, the other by Salt Lake City. Indian disturbances and the insecurity of the roads have during the past year almost entirely closed the latter; so that the chief exit is by the former route. Shipments from Idaho are made chiefly by way of Portland and the inland stage route through Humboldt and across the Sierra Nevada. On both of these routes it is alleged that they are liable to become merged with the products of other States and Territories. It has been impossible to obtain an account of the shipments from each agency at the express office of Wells, Fargo & Co., at San Francisco. For reasons of private expediency, they refrain from giving the desired information. We have, however, the aggregate receipts at their office, and, knowing very nearly what amount can fairly be credited to California, Nevada, and British Columbia, can draw reasonable conclusions as to the proportion derived from Idaho, Washington, and Oregon. From the best information available, the following is a near approximation to the total gold and silver product for the year ending January 1, 1867:

California	$25,000,000
Nevada	20,000,000
Montana	12,000,000
Idaho	6,500,000
Washington	1,000,000
Oregon	2,000,000
Colorado	2,500,000
New Mexico	500,000
Arizona	500,000
	70,000,000
Add for bullion derived from unknown sources within our States and Territories, unaccounted for by assessors and express companies, etc	5,000,000
Total product of the United States	75,000,000

The bullion product of Washington is estimated by the surveyor-general at $1,500,000. That of Oregon is rated as high as $2,500,000. Intelligent residents of Idaho and Montana represent that the figures given in the above estimate, so far as these Territories are concerned, are entirely too low, and might be doubled without exceeding the truth. The product of Idaho alone for this year is said to be from $15,000,000 to $18,000,000. That of Montana is estimated by the surveyor-general at $20,000,000. Similar exceptions are taken to the estimates of Colorado, New Mexico, and Arizona. As I have no grounds for accepting these statements beyond the assertion that most of the bullion is carried away in the pockets of the miners, I am inclined to rely upon the returns of the assessors, express companies, and official tables of export. Admitting that a fraction over 7 per cent may have escaped notice, although reasonable allowance is made for this in the estimate of $70,000,000, and

that a considerable sum may be derived from sources not enumerated, I feel confident the additional allowance of $5,000,000 is sufficient to cover the entire bullion product of the United States for the year 1867, thus making the aggregate from all sources $75,000,000, as stated in the report of the Secretary of the Treasury.

I have endeavored to obtain returns of the annual product of each State and Territory since 1848, but for the reasons already stated, and in the absence of reliable statistics, it has been impossible to make the necessary divisions with more than approximate accurracy. As nearly as I can judge from the imperfect returns available, the following, in round numbers, is not far from the total product:

California	$900,000,000
Nevada	90,000,000
Montana	65,000,000
Idaho	45,000,000
Washington	10,000,000
Oregon	20,000,000
Colorado	25,000,000
New Mexico and Arizona	5,000,000
In jewelry, plate, spoons, etc., and retained for circulation on Pacific Coast	45,000,000
	1,205,000,000
Add for amounts buried or concealed and amounts from unenumerated sources, and of which no account may have been taken	50,000,000
	1,255,000,000

This statement requires explanation. Up to 1855 a considerable portion of the gold taken from California was not manifested. In 1849 the actual yield was probably $10,000,000; in 1850, $35,000,000; in 1851, $46,000,000; in 1852, $50,000,000; in 1853, $60,000,000, and in 1854, $53,000,000. The amount unaccounted for by manifest was not so great after the last date. In 1861 Nevada and Idaho commenced adding their treasure to the shipments, so that after that date a deduction for the amounts produced from these sources would be necessary, if the manifest alone were taken as a criterion, in order to arrive at the product of California.

An addition should be made for the amount retained for currency, estimated by some as high as $45,000,000, but probably not exceeding $35,000,000 or $40,000,000; and for plate, jewelry, etc., of California gold, say, $2,000,000, and Nevada silver, $3,000,000.

Incorporated in these shipments are the amounts received from Nevada, Idaho, Oregon, Arizona, Washington, and British Columbia, but these can not be deducted from the manifest of exports, according to the express returns, since the proportions are not accurately known of the amounts, retained and shipped, derived from separate forces.[1]

The second commissioner, Mr. Rossiter W. Raymond, in his report for 1870, describes the method he formulated to ascertain the yield of the mines in the following terms:

Desirous of obtaining as much information as possible with the limited appropriation at my disposal, and also of having this information arranged according to a uniform plan, so that it might be introduced in my report in a comprehensible and intelligible manner without being too voluminous, I had deemed it best, after mature deliberation, to make the attempt to collect certain statistics by issuing blanks. Five different blanks were prepared: No. 1 to contain the production of gold and silver during the year; No. 2, the producing mines; No. 3, the mining

[1] Mineral Resources of the United States, J. Ross Brown. Vol. II, 1868, pp. 4, 5, 6, and 7.

claims; No. 4, the costs of mining and reducing ores, and No. 5, the mills running in a certain district. These blanks were sent to one or more principal agents in each State or Territory, with instructions to distribute the same in the following manner:

(1) To send sets to county assessors, district assessors, and county surveyors.

(2) To the editors of newspapers in each county, with request of calling attention to the importance of gathering statistics editorially.

(3) To superintendents of leading mines.

(4) To the owners or superintendents of all mills contained in the list published in Langley's Pacific Coast Directory for 1867.

(5) To agents of Wells, Fargo & Co. in the principal mining towns.

(6) To prominent individuals in the various counties known to be interested in mining.

(7) To proprietors of smelting furnaces and "process" men.

(8) To procure information, in relation to new mills, etc., from founderies and iron works, and to send blanks to owners and superintendents of such mills.

(9) To call personally on such mine owners and superintendents as might be located in the immediate vicinity of any agent's place of residence.

The result has been, on the whole, a great disappointment to me as far as the use of the blanks is concerned. In fact, none were received properly filled, except from California, and even those very scattering. In that State it was remarked, as a general rule, that the superintendents declined giving any information whatever except after consultation with owners. The best and fullest returns were from owners who superintended their own mines and mills. Many of the owners of mines residing in San Francisco have not been willing to give any information whatever.

The following statement will show forcibly the indifference with which requests for information have been treated in most cases:

NUMBER OF BLANKS SENT AND ANSWERS RECEIVED FOR CALIFORNIA.

Counties.	Sets of blanks sent.	Answers received.	Counties.	Sets of blanks sent.	Answers received.
Alpine	10	2	Tuolumne	18	4
Amador	33	2	Yuba	14	3
Butte	8	2	Inyo and Kern	4	2
Calaveras	24	2	Trinity and Siskiyou	4	.....
El Dorado	18	1	Klamath and Del Norte	4	.....
Placer	36	6	Mono and Los Angeles	3	.....
Plumas	22	3	Nevada	4	1
Shasta	10	2	Total	234	31
Sierra	22	1			

Blank No. 1.—Only two or three of this class were returned and filled, the quartz miners declining as a rule to give the information required under the heads "Number of tons of ore," "Average yield," "Total product," etc. Other information required on this blank was sometimes given on blanks Nos. 2 and 5.

Blank No. 2.—This blank has received more attention and has been well filled in a number of cases except the last column, "Product of the year."

Blank No. 3.—Few of these were returned at all, probably because there are but few "Live" claims which would not come under the head of "Producing mines" in blank No. 2.

Blank No. 4.—This blank has been well filled from every county wherever there was a disposition shown to give any information.

Blank No. 5.—Has received prompt attention and contains a large proportion of the mills running in the various districts.

The cement and placer miners have with a very few exceptions refused to furnish any information whatever.[1]

Mr. Raymond elsewhere says:

The difficulty of ascertaining the production of gold and silver in this country is peculiarly great, by reason of the lack of organized means and the extent of the field through which our mines are scattered, as well as the nature of the industry itself, and the motives which influence the minds of those engaged in it to withhold from publication the full and true account of its results.

When I entered upon my duties as commissioner of mining statistics I gave this subject careful attention. My predecessor had presented estimates of bullion production, involving confessedly a large excess over the amount actually accounted for by the statistics of either express shipments, exports and coinage, or the bullion tax. He had recommended the collection of accurate and comprehensive returns through resident agents in the mining States and Territories, a system which was not practicable then and has not been practicable since, on account of the limited funds appropriated for the work. So far, however, as circumstances would permit, I have pursued the policy of obtaining from experts in different regions estimates of such portions of the production as were not covered by detailed and accurate returns, using moreover my own judgement, based upon extensive annual journeys of observation, in the modification of such estimates as I had reason to believe were without sufficient foundation.

The elements entering into conclusions of this character are: The reports of production from single leading mines; the express shipments of bullion; the rates charged by express companies; the number of miners, white and Chinese, and the respective wages paid; the number and capacity of stamps running; the cost of mining and reduction, etc. The aggregate product of bullion thus obtained is of course merely a rude estimate. It has never been put forward as anything else, and I do not feel called upon to defend its accuracy. * * *

These results are obtained without reference to the statistics of coinage and export, and largely exceed the aggregate of those two items. According to some writers, however, the total annual product of bullion may be closely approximated by merely adding together the coinage of domestic gold and silver at the mint and its branches (or the deposits for coinage less the amount returned to depositors in bars) and the exports of bullion of native production. I do not agree with this view, and I shall give at some length my reasons for dissent. These may be classed under two general heads: First, the imperfection of the data afforded for an accurate calculation of either coinage or exportation; and, second, the inadequacy of the method itself. I need scarcely add, that if I had not become sincerely convinced on these points I should certainly have saved myself much independent labor and research, and adopted the comparatively very cheap and easy system of studying the mining industry and its results by means of mint and custom-house reports. * * *

Combining these tables of coinage and exports, we obtain—

COINAGE AND EXPORT OF DOMESTIC GOLD AND SILVER FOR THE CALENDAR YEARS 1867, 1868, 1869, AND 1870.

Year.	Coinage.	Export.	Total.
1867	$24,126,023	$34,695,826	$58,821,849
1868	19,432,339	31,389,835	50,822,174
1869	19,464,346	26,430,299	45,894,645
1870	23,003,650	28,771,299	51,774,949

[1] Mineral Resources of the United States, by R. W. Raymond, vol. 4, 1870, pp. 13, 14.

Whoever chooses to accept these totals as fairly representing the production of the country may do so; for my part, I can not regard them as complete. I have already shown the impracticability of obtaining from the mint returns a correct account of the domestic gold and silver turned into coinage (though a recent writer avers that this item is furnished by the reports of the Director of the Mint "with absolute accuracy"); and it may be added that there is grave reason to doubt the figures given for exports. In addition to private information received on this point from the Statistical Bureau, and conclusions drawn from personal inquiry into the manner of making up these figures, I may refer to the annual report of the Director of the Bureau of Statistics, Hon. Alexander Del Mar, dated November, 1867, where it is shown that the law under which the statistics of exports are obtained refers to vessels only, and therefore takes no account of overland exports.[1]

In the year ending June 30, 1867, $6,211,752 in treasure was exported overland to Canada alone. Of course this was mostly coin, yet a part was undoubtedly in bars, and it must be remembered that this item (taken from Canadian tables and not found in our own) does not include any other of the then separate British provinces; nor is there any record of the exports into Mexico, although the large amount of commerce carried on through the "free zone" must involve some movement of treasure.

Again, Mr. Raymond says:

It will be observed that, although collectors of customs are forbidden to grant a clearance for any vessel bound to a foreign place unless full manifests of the cargo are previously furnished, there is no penalty in case a vessel obtains a clearance and departs without giving a full manifest. A comparison of our exports with the imports officially reported by the principal countries with which we trade, and a detailed examination of the export manifests at some of our large ports, established the fact that this is not unfrequently the case.

The British commissioners of customs remark, in a report upon this subject: "Exporters often endeavor, and not unfrequently with success, to ship their goods without clearance, in order to avoid the knowledge of their transactions which might be obtained through the bill of entry office." This motive has acted with greater force during the last seven years in the case of gold and silver than in that of any other commodities. The speculation in these two articles has been intense, continuous, and full of rapid fluctuations beyond all previous precedents. There has been the strongest possible inducement to conceal the true amounts of specie and bullion exported and the weakest possible means of preventing such concealment. Finally, stories of surreptitious shipments are current in Wall street.

On the other hand, it is equally desirable sometimes, for purposes of speculation, to overrate the exports of treasure, although it seems less easy of performance, except by actual false swearing.

* * * * * * *

Having been defeated in the attempt to obtain other data for comparison, and deeming the above results a proof that the British statistics are even worse than our own, I am obliged to conclude that the information afforded from such sources is neither accurate nor susceptible of correction by analysis and comparison.

It is but fair to add that attempts have been made to secure more careful returns from collectors of ports.

* * * * * * *

Having said thus much as to the imperfection of the data afforded by the reports of the mint and the custom-house for ascertaining the amounts of domestic coinage and exports of gold and silver, I will add a few words, setting forth my general objection to the theory that these amounts, if correctly ascertained, would give the

[1] In this respect, as well as some others, the Commissioner is inaccurate. It is true that the law referred only to vessels, but it did take account of a very large proportion of the overland movement. The trouble was that it did not take in the whole of it.—A. D.

aggregate annual product of the country. The article above quoted from the Alta California recognizes the fact that amounts of bullion in transitu or in the hands of dealers at the end of the year are not included in this method of calculating the product. But this is a small matter compared with the omission of sundry items, which are not made good, as in the one alluded to by subsequent reports.

In the first place, no account is taken of the gold and silver exported in the form of ores and mattes. I have direct information of more than a million dollars in value thus exported during 1870; yet the item appears neither in the merchandise nor in the treasure reports of the custom-house. Perhaps it is believed, to use the phrase of the Alta, that gold and silver shipped in ballast do not "affect the markets of the world." As my duty, however, does not concern the markets of the world but the actual results of American industry, I think this item worthy of notice.

Another instance in point is the amount of gold dust annually lost by its use as currency. This practice has almost ceased, save in a few of our productive placer districts, where several millions of dollars are still annually passed from hand to hand in trade. I estimate the quantity produced and lost this way during 1870 at $100,000.

Again, in several Western States and Territories there is a considerable local manufacture of jewelry from gold dust without further preparation than that which the manufacturers give it. The small town of Helena, Mont., contains five establishments, some of which employ a considerable number of workmen, and all of which manufacture jewelry from native gold alone. A large amount of gold is annually hoarded moreover in the form of specimens. In one or two instances the superintendents of mines have adopted the practice of selling specimens, and the amounts realized from such sales indicate a larger consumption in this direction than most persons would imagine. It is safe to say that $400,000 annually are worked up by local jewelers or hoarded as specimens.

But a more important matter than any of these is the annual consumption of gold and silver by the manufacturing jewelers, watch-case, gold-pen, and spectacle makers, dentists, and silver platers of the country. Those who think they can obtain the aggregate product of the precious metals by adding domestic coinage and domestic bullion exports assume that our gold and silver is either coined or exported, and that all the domestic gold and silver used in manufactures has been previously recorded under one of these heads. This very convenient assumption is totally untrue. Our manufacturing jewelers do not, as a rule, melt coin at all. They either buy mint bars or they purchase gold prepared for their special uses in bars, plate, wire, foil, etc., from parties who make a business of this part of the work.

These gold-preparing houses, of which there are several in the city of New York, take a large amount of fine bars from the mint and assay offices; but they also refine gold for themselves before alloying it for the manufacturers. Their deposits at the New York assay office include foreign, worn, and mutilated coin, unparted bars, and gold dust. The quantity which they refine for themselves it is impossible for me to state. Perhaps the manufacturing blanks of the census, when published, will throw some light on this point. At the present stage of the work in the Census Bureau no information regarding it is available.

Estimates as to the amount of gold consumed by jewelers, etc., vary considerably. The lowest I have obtained from those engaged in the business is $9,000,000 annually; the highest is over $13,000,000.

As remarked above, Mr. Raymond published his eighth and last report in 1877. It covered the mining statistics of 1875. The results he reached in these reports are summarized in the following table:

Table showing the production of the precious metals in the several States and Territories from 1868 to 1875, according to the report of Mr. Rossiter W. Raymond.

States and Territories.	1868.	1869.	1870.	1871.
California	$22,000,000	$22,500,000	$25,000,000	$20,000,000
Nevada	14,000,000	14,000,000	16,000,000	22,500,000
Montana	15,000,000	9,000,000	9,100,000	8,050,000
Idaho	7,000,000	7,000,000	6,000,000	5,000,000
Oregon and Washington	4,000,000	3,000,000	3,000,000	2,500,000
Arizona	500,000	1,000,000	800,000	800,000
New Mexico	250,000	500,000	500,000	500,000
Colorado and Wyoming	3,250,000	4,000,000	3,775,000	4,763,000
Utah	.....	.....	1,300,000	2,300,000
Elsewhere	1,000,000	500,000	525,000	250,000
Total	67,000,000	61,500,000	66,000,000	66,663,000

States and Territories.	1872.	1873.	1874.	1875.
California	$19,049,098	$18,025,722	$20,300,531	$17,753,151
Nevada	25,548,801	35,254,507	35,452,233	40,478,369
Montana	6,068,339	5,178,047	3,844,722	3,573,600
Idaho	2,695,870	2,500,000	1,880,004	1,750,000
Oregon and Washington	2,000,000	1,585,784	763,605	1,246,978
Arizona	625,000	500,000	487,000	750,000
New Mexico	500,000	500,000	500,000	325,000
Colorado and Wyoming	4,761,465	4,070,263	5,188,510	5,302,810
Utah	2,445,284	3,778,200	3,911,601	3,137,688
Elsewhere	250,000	250,000	100,000	500,000
Total	63,943,857	71,642,523	72,428,206	74,817,596

In his last two annual reports Mr. Raymond neglected to express his opinion on the share of each of the precious metals in the total production. The reason is that he had no satisfactory information on the relative amount of gold and silver in the ores of the Comstock vein when he prepared them.

In 1874 Mr. Raymond, from all the data obtainable, made a calculation of the product of gold and silver separately in the United States from 1848 to 1873, which he communicated to the Director of the Mint, together with the following explanatory letter:

NEW YORK, *October 5, 1874.*

SIR: I inclose to you estimate of the gold and silver product of the United States since 1848. * * * The estimate of the gold product follows down to 1862, a table compiled by J. Arthur Phillips, and published in his book, "Gold and Silver." From 1862 to 1866 the product of California is calculated by deduction from the express receipts of uncoined treasure in San Francisco, the receipts from Nevada, and adding 2 per cent to the remainder. From 1868 to 1873 the products of gold are based on the reports of the Commissioner of Mining Statistics, the proportion of gold and silver being estimated as well as possible.

The statistics in silver production are taken from Whitney, Richthofen, the official reports of companies, and the express receipts. Two-thirds of the value of the Comstock product has been assumed to be silver; the remainder gold. The figures can not claim a high degree of accuracy, but the totals of gold and silver are approximately correct.

Very respectfully,

R. W. RAYMOND,
United States Commissioner of Mining Statistics.

Hon. H. R. LINDERMAN,
Director of the Mint.

ESTIMATE OF GOLD PRODUCT OF THE UNITED STATES SINCE 1847.

Year.	California.	Other States and Territories.	Total.
1848	$10,000,000	.....	$10,000,000
1849	40,000,000	.....	40,000,000
1850	50,000,000	.....	50,000,000
1851	55,000,000	.....	55,000,000
1852	60,000,000	.....	60,000,000
1853	65,000,000	.....	65,000,000
1854	60,000,000	.....	60,000,000
1855	55,000,000	.....	55,000,000
1856	55,000,000	.....	55,000,000
1857	55,000,000	.....	55,000,000
1858	50,000,000	.....	50,000,000
1859	50,000,000	.....	50,000,000
1860	45,000,000	$1,000,000	46,000,000
1861	40,000,000	3,000,000	43,000,000
1862	34,700,000	4,500,000	39,200,000
1863	30,000,000	10,000,000	40,000,000
1864	26,600,000	19,500,000	46,100,000
1865	28,500,000	24,725,000	53,225,000
1866	25,500,000	28,000,000	53,500,000
1867	25,000,000	26,725,000	51,725,000
1868	22,000,000	26,000,000	48,000,000
1869	22,500,000	27,000,000	49,500,000
1870	25,000,000	25,000,000	50,000,000
1871	20,000,000	23,500,000	43,500,000
1872	19,000,000	17,000,000	36,000,000
1873	17,000,000	19,000,000	36,000,000
Total	985,800,000	254,950,000	1,240,750,000

ESTIMATE OF SILVER PRODUCT OF THE UNITED STATES.

From 1849 to 1858, $50,000 per annum	$500,000
1859	100,000
1860	150,000
1861	2,000,000
1862	4,500,000
1863	8,500,000
1864	11,000,000
1865	11,250,000
1866	10,000,000
1867	13,500,000
1868	12,000,000
1869	12,000,000

1870	$16,000,000
1871	23,000,000
1872	28,750,000
1873	35,750,000
Total silver	189,000,000
Total gold	1,240,750,000
Grand total, 1849 to 1873, inclusive	1,429,750,000

The above figures have been adopted as final in the table of the production of gold and silver in the United States from 1792 to the present, published yearly in this series of reports. As Mr. Raymond himself remarks in the letter given above, they can not claim a high degree of accuracy, but it may be claimed for them that they are the nearest approach to correctness that could be made by even so painstaking a statistician.

The production of the precious metals since that year has been estimated by the Directors of the Mint who have continued the above table compiled by Mr. Raymond.

In the report of the Director of the Mint for the fiscal year ended June 30, 1879, Mr. Horatio C. Burchard, the successor of Dr. Linderman, says:

In the report of the Director of the Mint for 1874 a table was published which had been prepared by R. W. Raymond, United States Commissioner of Mining Statistics, showing the production of gold and silver in this country from 1848 to 1873. I am unable at present to review the data from which this table was prepared or to vouch for its accuracy, but it seems to be desirable that these estimates should be brought up to date.

The following is an approximate estimate of the domestic production for the last six years. It is condensed from a table appended to this report, and embraces the entire product of each year, unless a larger amount has been used in the arts or bullion has been clandestinely exported, of which there is no proof or reasonable suspicion:

DOMESTIC PRODUCTION OF GOLD AND SILVER, 1874 TO 1879.

Fiscal year ending June 30—	Gold.	Silver.	Total.
1874	$33,490.902	$37,324,594	$70,815,496
1875	33,467,856	31,727,560	65,195,416
1876	39,929,166	38,783,016	78,712,182
1877	46,897,390	39,793,573	86,690,963
1878	51,206,360	45,281,385	96,487,745
1879	38,899,858	40,812,132	79,711,990
Total	243,891,532	233,722,260	477,613,792

These amounts were ascertained by adding to the amount of domestic bullion purchased or deposited for coinage during the year the amount of domestic bullion exported, consumed in the arts and manufactures, and stock of bullion remaining in the country.

The value of the gold and silver contained in argentiferous ores exported in the last six years has not been included in this estimate. Their total gross value for

the whole period was little more than a million dollars, and it is impossible to ascertain how much of this valuation was gold, silver, lead, or copper; and shipments have gradually decreased until, during the fiscal year ended June 30, 1879, they amounted only to $148,195. The statistics of the production of Germany, France, and England include these ores in the reports of the value of gold and silver produced in those countries from Spanish and American ores.

DISPOSITION OF DOMESTIC PRODUCTION.

A reliable test of the accuracy of estimates of total production is their agreement with the statistics which show the disposition annually made of the precious metals.

Nearly all of the gold and a large portion of the silver produced in the United States during the last year was coined at the mints or used in domestic manufactures, arts, and ornamentation. The surplus was exported to nonproducing countries.

The amount annually used for coinage and exported is readily ascertained. The mint records show the one and the customs returns the other. Foreign coin and bullion are now reported separately from domestic. But to obtain accurate statistics of the amount annually consumed by abrasion or loss of coin, and used in the arts, manufactures, and ornamentation is a very difficult task.

* * * * * * *

The estimates of the amount of gold and silver annually consumed in the United States in the manufactures, the arts, and ornamentation at the present time widely vary.

In computations heretofore made by this office it has been placed at $5,000,000, and at the highest $6,000,000, while in the report of the silver commission it was given as a conjecture that the annual consumption of silver was $10,000,000 in the United States for the arts and manufacturing purposes and $50,000,000 in all countries outside of Asia.

In order to arrive at an approximate estimate of the consumption of gold and silver in the United States I directed an examination to be made, at the mints and assay offices manufacturing fine bars, of their books for the last six years, and a report to be made of the amount of fine bars of gold and silver prepared and issued for manufacturing purposes.

The reports show that during the above period of time there were issued for manufacturing purposes $21,879,040 of gold and $22,250,283 of silver, being an annual average consumption of gold bullion obtained from the New York assay office alone of $3,646,506 and $3,708,380 of silver bullion.

The amount paid out at that office for these purposes during the last year was $2,901,844 of gold and $4,482,975 of silver.

Fully one-half of the total bullion product of the country is parted and refined by private enterprise, and a considerable portion of the gold and silver used by manufacturers comes from such refineries. I have assumed that one-fourth of the total consumption for this purpose is of bullion other than New York assay-office bars. This is a moderate estimate for the additional amount, including, as it does, all supplies from private sources and refineries and bars issued by the coinage mints and by the other assay offices.

I have attempted to secure further statistics of the consumption in the United States by addressing circular letters to all manufacturers whose addresses I could obtain who consume gold or silver in the preparation of chemicals and in the manufacture of jewelry, watch cases, and other solid or plated wares. The circular referred to requested that they would specify the various forms of the metals used, whether United States coin, foreign coin and old manufactured articles reworked, or bullion. The replies that have been received, while incomplete as to the total consumption, are valuable in exhibiting the proportion of the different specified forms used, and also show that the gross amount would be in excess of estimates previously made.

Out of 3,506 addressed, 1,401 replies were received; and of the latter, 448 were

manufacturing and consuming gold and silver, and reported the above amounts, leaving 2,105 not heard from. It is obvious that the estimates of this office are not in excess of what probably would have been reported as the actual amount of the precious metals used had complete and full returns been made.

From all the information obtained it may be safely assumed that the annual consumption in the United States of precious metals in all forms now averages $7,000,000 of gold and $5,000,000 of silver, making a total of $12,000,000; and fuller statistics may show a greater amount thus used. In estimating the amount of domestic production appropriated annually for this use, I have added one-third to the value of such bars furnished from the New York assay office, which gives the following consumption for the last fiscal year:

Gold, $3,869,125, and silver, $5,977,300; and an average annual consumption, for the last six years, of gold, $4,458,104, and silver, $4,854,527. The annual coinage export and consumption of bullion produced in the United States (not including old plate and coin) for the last and five preceding years appears, from data received, to be as follows:

GOLD.

Fiscal year.	Coinage.	Used in arts and manufactures.	Exported (reported by Bureau of Statistics).	Total.
1874	$25,034,031	$4,578,328	$3,878,543	$33,490,902
1875	25,851,983	5,382,098	2,233,775	33,467,856
1876	33,887,086	4,153,184	1,888,896	39,929,166
1877	42,125,662	3,687,192	1,084,536	46,897,390
1878	45,922,340	5,078,701	205,319	51,206,360
1879	35,005,959	3,869,125	24,774	38,899,858

SILVER.

1874	$5,764,538	$4,406,560	$27,153,496	$37,324,594
1875	10,291,805	4,237,841	17,197,914	31,727,560
1876	19,730,654	3,812,018	15,240,344	38,783,016
1877	24,543,939	3,774,240	11,475,394	39,793,573
1878	25,036,188	5,210,152	15,035,045	45,281,385
1879	22,951,768	5,977,300	11,883,064	40,812,132

The first volume of the series of reports entitled "Report of the Director of the Mint on the Production of the Precious Metals in the United States," was published in 1881, Mr. Horatio C. Burchard being the Director at the time. In the first "Production report" Mr. Burchard thus refers to the method employed by him in collecting the statistics of the output of gold and silver in the United States:

The total production of gold and silver in the United States and the probable yield of the mines of each State and Territory have been annually estimated by the Director of the Mint and published in his reports. These statements have been based upon information obtained from officers of the mints and others in the mining regions, and upon statements of depositors as to the locality of production of the gold and silver received at the various mints and assay offices. From these incomplete data approximate estimates have been annually made, which, although probably inaccurate in many details, have been found exceedingly useful for statistical purposes.

The Mint Bureau, through its subordinate institutions, possesses unusually excel-

lent facilities for obtaining such information, as during the last fiscal year nearly all the gold produced by the mines of the country was deposited at the mints and assay offices and exchanged for coin or bars, and of the silver produced in the United States more than three-fourths was purchased by the Government for coinage or deposited for bars. The depositor or seller himself furnished the locality of production of nearly half of the gold and about one-third of the silver deposited or purchased, the balance being from unknown localities.

To ascertain the State or Territory in which the latter was produced it became necessary to employ other means and look elsewhere for information. This information has been sought, both by letter or personal interview, from mine and mill owners, smelting, refining, and reduction works, banks and bullion brokers, express companies, railroad and freight agents, and custom-houses. The information thus obtained, while incomplete in detail from any one source, has been of great value as a means of comparison and arriving at general results. Six refining and reduction works alone, east of the Rocky Mountains, treated more than half of the silver product of the country.

It was deemed advisable to assign to mint officers, or other competent persons in the mining regions, the territory in their immediate vicinity, with instructions to procure from the officers, agents, and owners of mines, mills, and reduction works as full and detailed information as possible, while the statistics of the amount of gold and silver ore and bullion treated at or transported to other refineries and placed upon the market and exported was left to be ascertained under the immediate direction of this office.

And in his last report on the production of the precious metals in the United States, he says:

While it might have sufficed to have published merely the results of these investigations embodied in the estimates of the total product of gold and silver during the year, it seemed desirable to trace the bullion known to have been converted into coin, or manufactured into bars and exported, or used in the arts, back to the district or mining region from which it was derived.

This work necessitated the accumulation of statistics as full as possible of the treatment, movement, and final disposition of the bullion from its extraction from the earth in the form of ore or native metal to its delivery to the Government for coinage or to private parties for export or other use. Supplementing this with direct information as to the actual yield of the most important mines and with careful and generally reliable reports from correspondents and mint officers in regard to the condition and progress during the year of mining for the precious metals in the principal localities, States, and Territories producing gold and silver, it is believed that sufficient data has been obtained to justify an estimation of the yield of the various counties, as well as of the States and Territories.

It would be a gratification to me to publish all the detailed information in regard to the actual product of individual mines, so that the accuracy of my conclusions could be tested by the data upon which they are based, but most of these facts were confidentially disclosed and not to be made public except with express permission.

Horatio C. Burchard was succeeded as Director of the Mint by Dr. James P. Kimball in 1885. Dr. Kimball's method of estimating the production of gold and silver in the United States may be inferred from the two following tables, taken from the report of the Director of the Mint upon the production of the precious metals in the United States during the calendar year 1885, pages 18 and 23, respectively.

ELEMENTS OF THE ESTIMATE OF GOLD PRODUCTION, 1885.

Bullion deposited at mints, etc., classified as of domestic production	$30,893,184
Bullion classified as of domestic production exported other than United States mint or assay-office bars	105,371
Bullion classified as of domestic production reported by 30 leading private refineries as having been furnished manufacturers in 1885[a]	1,272,606
Total	32,271,161
Deduct—	
Foreign gold contained in refined bars from Selby refinery, classified at San Francisco mint as domestic	450,000
Estimated production	31,821,161

ESTIMATE OF THE PRODUCTION OF SILVER IN THE UNITED STATES DURING THE CALENDAR YEAR 1885.

Production.	Amount.
Deposits at mints and assay offices classified as domestic	$31,570,758
Exports classified as domestic, other than United States mint or assay-office bars, at monthly average parity of London rates reduced to coining value	23,559,602
Domestic bullion reported by private refineries as made into bars for persons and firms engaged in the arts and ornamentation	395,238
Total	55,525,598
Deduct—	
Excess of imports of foreign silver bullion, classified as such at the customhouses, over the foreign silver bullion deposited at the mints, classified as such	3,865,786
Estimated production	51,659,812

Since 1890, when Mr. E. O. Leech, the successor of Dr. James P. Kimball as Director of the Mint, published his first report on the Production of Gold and Silver in the United States, this Bureau has made each year two independent calculations of the gold and silver product of the United States in the year under consideration and taken their average as the actual product. A clear idea of the way in which these calculations are made at present may be formed by consulting the introductory pages of the present report.

The most competent statisticians have approved and commended the method now employed by the Bureau. The late lamented Dr. Soetbeer, undoubtedly the most competent judge in such matters in the present or any other generation, said of it, in Hildebrand's Jahrbücher, 1891, pages 523, 546, and 547:

To show by an example in what manner the Bureau of the Mint has endeavored to ascertain as nearly as possible the precious-metal production of the United States, we may, by way of explanation, state how the amount of the gold product of the country for the year 1889 was reached.

With the exception of the comparatively small amounts of gold newly produced from domestic mines which are immediately employed by goldsmiths, all the gold product of the country finds its way to public institutions, either in the form of unrefined bullion directly from the mines or gold washings, or in the form of fine gold bars from private parting establishments. The charges for refining at the mints,

[a] Comprising all of importance out of 37 addressed.

as well as for the attestation by them of the weight and fineness of the bars deposited there, are insignificant. Coinage is done gratis for the owner, and this is true also of the transportation to the mint at Philadelphia of the gold to be coined.

In this way the total gold product of the country, so to say, comes to the knowledge of the Mint Bureau. During the year 1889, 689,658 ounces of gold in the form of unrefined bullion were deposited at the mints; and of the 911,676 ounces of fine gold refined at private institutions, 856,361 ounces were stamped at the assay office in New York and at the mint in San Francisco. There are also special data relating to the quantity of gold imported from foreign countries, especially from Mexico and British Columbia, into the United States and directly employed or refined there.

The statistics of the production of gold in the year 1889 were therefore made up as follows:

ESTIMATE OF THE GOLD PRODUCT OF THE MINES OF THE UNITED STATES, 1889.

Sources.	Fine ounces.
Bullion of domestic production deposited at mints and assay offices	1,546,019
Bullion of domestic production (other than United States Mint or assay office bars) exported from the United States	54,012
Bullion of domestic production reported by 26 private refineries in the United States as having been made into bars for manufacturers and jewelers	50,009
Total	1,650,040
Deduct:	
Foreign bullion reported by private refineries in the United States as contained in their product of fine gold bars deposited at mints and assay offices, and there classified as of domestic production	63,811
Domestic product for 1889	1,586,229

A further and independent calculation, according to data from the several mining districts, gave for the year 1889 the domestic product of gold at 1,587,632 ounces ($32,817,190). The average of these two results, $32,800,000 in round numbers, or 1,587,000 ounces, has been officially recognized as the product of gold in the United States during the year 1889.

From this example we can see from what material and by what method the statistics of the production of the precious metals in the United States are obtained. They are the result of careful, thorough investigation, and not a superficial estimate. * * *

The method at present followed by the Bureau to ascertain the annual output of the gold and silver mines of the United States reduces to a minimum the possibilities of serious error in the calculation of the amount of that output. It is scarcely possible that the results reached by it can vary to any great extent from the actual yield of the gold and silver mines of the country in the year under consideration. The object to be realized being to obtain the amount of the finished product of gold and silver put on the market in a given year, the Bureau has to depend only on the Government's records of its own mints and assay offices, the records of its exports, and information furnished by the owners of private refineries. But for the courtesy of the latter in furnishing the amounts of the precious metals prepared for the market in their establishments the difficulties in the way of reaching reliable figures in this domain would be as great as those that confronted the early

statisticians who concerned themselves with the annual production of gold and silver in the United States.

No higher praise can be bestowed on the calculations made by the Bureau of the Mint of the production of the precious metals in the United States; no stronger evidence of their accuracy and reliability can be produced than that volunteered by the late Dr. Soetbeer in the words: "They are result of careful, thorough investigation, and not a superficial estimate."

Indeed, the United States is the only great producing country whose gold and silver output from its own mines is at the present day ascertained with practical certainty, and this certainty is attained by the method it pursues in determining the amount of the finished product of the precious metals it puts annually on the market.

The gold product of Australasia is doubtless approximately correct, but only approximately so, because there is no certainty that the crude gold reported as produced in the colonies averages .920 fine. The same may be said of the gold yield of the South African Republic, whose output of crude gold is uniformly estimated to be .847½ fine.

The yearly product of Russia is taken to be equal to the amount deposited at the St. Petersburg mint, and does not represent the total yield, a large quantity being clandestinely exported through China and escaping declaration in other ways.

Germany gives the total amount of gold and silver refined in the country, but the information relative to the output of its own mines is not altogether satisfactory.

It would be difficult, if not impossible, however, to devise a method by which that of the United States could be more accurately determined than it is by the process employed for some years past by the Bureau of the Mint.

DEPOSITS AND REDEPOSITS OF GOLD AND SILVER DURING THE CALENDAR YEAR 1896.

The total weight, description, value, etc., of the gold and silver deposited and redeposited at the mints and assay offices of the United States during the year 1896 are exibited in the several tables given below:

TABLE SHOWING THE WEIGHT OF THE DEPOSITS AND REDEPOSITS OF GOLD BULLION AT THE MINTS AND ASSAY OFFICES OF THE UNITED STATES DURING THE CALENDAR YEARS 1895 AND 1896, AND THE INCREASE OR DECREASE OF THE SAME DURING THE LATTER YEAR.

Classification of deposits of gold bullion.	Calendar year—		Increase, 1896.	Decrease, 1896.	Net increase, 1896.
	1895.	1896.			
	Fine ounces.	*Fine ounces.*	*Fine ounces.*	*Fine ounces.*	*Fine ounces.*
Domestic bullion, crude	782,587	838,045	55,458	.....	.....
Domestic bullion, refinery bars	.....	329,542	329,542	.....	.....
Domestic bullion, refined	1,619,992	1,644,514	24,522	.....	.....
Domestic coin, Treasury transfers	10,579	53,410	42,831	.....	.....

TABLE SHOWING THE WEIGHT OF THE DEPOSITS AND REDEPOSITS OF GOLD BULLION AT THE MINTS AND ASSAY OFFICES OF THE UNITED STATES DURING THE CALENDAR YEARS 1895 AND 1896, AND THE INCREASE OR DECREASE OF THE SAME DURING THE LATTER YEAR—Continued.

Classification of deposits of gold bullion.	Calendar year—		Increase, 1896.	Decrease, 1896.	Net increase, 1896.
	1895.	1896.			
	Fine ounces.	*Fine ounces.*	*Fine ounces.*	*Fine ounces.*	*Fine ounces.*
Domestic coin, mutilated	42,580	39,611	.....	2,969	.....
Foreign bullion, crude	123,546	126,903	3,357	.....	.....
Foreign bullion, refined	557,482	515,075	.....	42,407	.....
Foreign coin, melted	56,728	745,277	688,549	.....	.....
Jewelers' bars, old plate, etc	165,355	145,723	.....	19,632	.....
Total deposits	3,358,849	4,438,100	1,144,259	65,008	1,079,251
Redeposits:					
Fine bars	1,096,783	312,335	.....	784,448	.....
Mint bars	.....	483,880	483,880	.....	.....
Unparted bars	432,702	402,935	.....	29,767	.....
Total gold received	4,888,334	5,637,250	1,628,139	879,223	748,916

TABLE SHOWING THE VALUE OF THE DEPOSITS AND REDEPOSITS OF GOLD BULLION AT THE MINTS AND ASSAY OFFICES OF THE UNITED STATES DURING THE CALENDAR YEARS 1895 AND 1896, AND THE INCREASE OR DECREASE OF THE SAME DURING THE LATTER YEAR.

Classification of deposits of gold bullion.	Calendar year—		Increase, 1896.	Decrease, 1896.	Net increase, 1896.
	1895.	1896.			
Domestic bullion, crude	$16,177,509	$17,323,926	$1,146,417	.....	.....
Domestic bullion, refinery bars	.....	6,812,238	6,812,238	.....	.....
Domestic bullion, refined	33,488,204	33,995,130	506,926	.....	.....
Domestic coin, Treasury transfers	218,697	1,104,088	885,391	.....	.....
Domestic coin, mutilated	880,204	818,836	.....	$61,368	.....
Foreign bullion, crude	2,553,930	2,623,322	69,392	.....	.....
Foreign bullion, refined	11,524,169	10,647,540	.....	876,629	.....
Foreign coin, melted	1,172,663	15,406,241	14,233,578	.....	.....
Jewelers' bars, old plate, etc	3,418,203	3,012,348	.....	405,855	.....
Total deposits	69,433,579	91,743,669	23,653,942	1,343,852	$22,310,090
Redeposits:					
Fine bars	22,672,519	6,456,530	.....	16,215,989	.....
Mint bars	.....	10,002,695	10,002,695	.....	.....
Unparted bars	8,944,765	8,329,418	.....	615,347	.....
Total gold received	101,050,863	116,532,312	33,656,637	18,175,188	15,481,449

TABLE SHOWING THE WEIGHT OF THE DEPOSITS AND REDEPOSITS OF SILVER BULLION AT THE MINTS AND ASSAY OFFICES OF THE UNITED STATES DURING THE CALENDAR YEARS 1895 AND 1896 AND THE INCREASE OR DECREASE OF THE SAME DURING THE LATTER YEAR.

Classification of deposits of silver bullion.	Calendar year—		Increase, 1896.	Decrease, 1896.	Net decrease, 1896.
	1895.	1896.			
	Fine ounces.	*Fine ounces.*	*Fine ounces.*	*Fine ounces.*	*Fine ounces.*
Domestic bullion, crude	556,368	479,407	.....	76,961	.....
Domestic bullion, refinery bars	.....	79,976	79,976	.....	.....
Domestic bullion, refined	5,817,212	3,332,089	.....	2,485,123	.....
Domestic coin, Treasury transfers	2,701,051	3,111,317	410,266	.....	.....
Domestic coin, mutilated	3,620	3,307	.....	313	.....
Trade dollars deposited	329	104	.....	225	.....
Foreign bullion, crude	968,095	703,284	.....	264,811	.....
Foreign bullion, refined	.....	4,793	4,793	.....	.....
Foreign coin, melted	56,822	169,591	112,769	.....	.....
Jewelers' bars, old plate, etc	603,690	525,842	.....	77,848	.....
Total deposits	10,707,187	8,409,710	607,894	2,905,281	2,297,477
Redeposits:					
Fine bars	67,717	13,056	.....	54,661	54,661
Unparted bars	259,094	100,952	.....	158,142	158,142
Total silver received	11,033,998	8,523,718	607,804	3,118,084	2,510,280

TABLE SHOWING THE VALUE OF THE DEPOSITS AND REDEPOSITS OF SILVER BULLION AT THE MINTS AND ASSAY OFFICES OF THE UNITED STATES DURING THE CALENDAR YEARS 1895 AND 1896, AND THE INCREASE OR DECREASE OF THE SAME DURING THE LATTER YEAR.

Classification of deposits of silver bullion.	Calendar year—		Increase, 1896.	Decrease, 1896.	Net decrease, 1896.
	1895.	1896.			
Domestic bullion, crude	$719,345	$619,840	.....	$99,505	.....
Domestic bullion, refinery bars	.....	103,403	$103,403	.....	.....
Domestic bullion, refined	7,521,244	4,308,155	.....	3,213,089	.....
Domestic coin, Treasury transfers	3,492,268	4,022,712	530,444	.....	.....
Domestic coin, mutilated	4,681	4,275	.....	406	.....
Trade dollars deposited	425	135	.....	290	.....
Foreign bullion, crude	1,251,678	909,296	.....	342,382	.....
Foreign bullion, refined	.....	6,198	6,198	.....	.....
Foreign coin, melted	73,467	219,269	145,802	.....	.....
Jewelers' bars, old plate, etc	780,528	679,877	.....	100,651	.....
Total deposits	13,843,636	10,873,160	785,847	3,756,323	$2,970,476
Redeposits:					
Fine bars	87,554	16,880	.....	70,674	.....
Unparted bars	334,990	130,524	.....	204,466	.....
Total silver received	14,266,180	11,020,564	785,847	4,031,463	3,245,616

GOLD AND SILVER (NOT INCLUDING REDEPOSITS) RECEIVED AT THE MINTS AND ASSAY OFFICES DURING THE CALENDAR YEARS 1880–1896.

Calendar year.	Gold.	Silver (coining value).	Total.
1880	$100,278,703	$35,103,825	$135,382,528
1881	98,763,426	30,326,848	129,090,274
1882	41,921,263	35,161,254	77,082,517
1883	51,089,456	36,978,184	88,067,640
1884	50,518,179	36,670,731	87,188,910
1885	44,714,052	35,836,725	80,550,777
1886	66,422,088	39,086,070	105,508,158
1887	74,724,077	46,381,333	121,105,410
1888	41,496,410	41,323,973	82,820,383
1889	42,599,206	41,977,265	84,576,471
1890	48,767,964	55,198,037	103,966,001
1891	60,849,552	70,994,120	131,843,672
1892	45,406,646	84,591,898	129,998,544
1893	69,419,223	62,465,005	131,884,228
1894	49,704,902	14,120,605	63,825,507
1895	69,433,579	13,843,636	83,277,215
1896	91,743,670	10,873,160	102,616,830

COINAGE OF THE UNITED STATES.

The following table exhibits the number of fine ounces and value of gold and silver coinage of the United States, by calendar years, from 1873 to 1896:

COINAGE OF GOLD AND SILVER OF THE MINTS OF THE UNITED STATES, 1873–1896.

Calendar year.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Coining value
1873	2,758,475	$57,022,748	3,112,891	$4,024,748
1874	1,705,441	35,254,630	5,299,421	6,851,777
1875	1,594,050	32,951,940	11,870,635	15,347,893
1876	2,253,281	46,579,453	18,951,777	24,503,308
1877	2,128,493	43,999,864	21,960,246	28,393,045
1878	2,408,400	49,786,052	22,057,548	28,518,850
1879	1,890,499	39,080,080	21,323,498	27,569,776
1880	3,014,163	62,308,279	21,201,232	27,411,694
1881	4,685,162	96,850,890	21,609,970	27,940,164
1882	3,187,317	65,887,685	21,635,469	27,973,132
1883	1,414,581	29,241,990	22,620,701	29,246,968
1884	1,160,601	23,991,756	22,069,935	28,534,866
1885	1,343,519	27,773,012	22,400,433	28,962,176
1886	1,400,240	28,945,542	24,817,064	32,086,709
1887	1,159,664	23,972,383	27,218,101	35,191,081
1888	1,518,046	31,380,808	25,543,242	33,025,606
1889	1,035,899	21,413,931	27,454,465	35,496,683
1890	990,100	20,467,182	30,320,999	39,202,908
1891	1,412,614	29,222,005	21,284,115	27,518,857
1892	1,682,832	34,787,223	9,777,084	12,641,078
1893	2,757,231	56,997,020	6,808,413	8,802,797
1894	3,848,045	79,546,160	7,115,896	9,200,351
1895	2,883,941	59,616,358	4,407,055	5,698,010
1896	2,276,192	47,053,060	17,858,594	23,089,899
Total	50,509,786	1,044,130,051	438,718,784	567,232,376

In the Appendix a table will be found showing the value of the coinage executed by each mint from 1792 to 1897.

COINAGE EXECUTED AND BARS MANUFACTURED DURING THE CALENDAR YEAR 1896.

The two tables hereafter given show the coinage executed and the value of the bars manufactured at United States institutions during the calendar year 1896.

COINAGE EXECUTED IN THE UNITED STATES, CALENDAR YEAR 1896.

Description.	Pieces.	Value.
Gold	2,630,351	$47,053,060.00
Silver dollars (act of July 14, 1890)	19,876,762	19,876,762.00
Subsidiary silver coin	11,748,329	3,213,137.05
Minor coin	47,900,213	832,718.93
Total	82,155,655	70,975,677.98

BARS MANUFACTURED, CALENDAR YEAR 1896.

Description.	Gold.	Silver.
Fine bars	$45,882,570.93	$6,454,421.74
Mint bars	6,668,894.18	13,146.70
Standard bars	4,516,968.90	.....
Unparted bars	8,161,313.63	120,150.75
Total	65,229,767.64	6,587,719.19

PURCHASE OF SILVER.

Since November 1, 1893, the date of the repeal of the purchasing clause of the act of July 14, 1890, the purchase of silver bullion by the Government has consisted of the silver contained in gold deposits, the small fractions of silver for return in fine bars, the amount retained in payment of charges, surplus silver bullion returned by the operative officers of the mints at the annual settlement, and mutilated domestic silver coin purchased for the subsidiary silver coinage under the provisions of section 3526 of the Revised Statutes.

AMOUNT, COST, AVERAGE PRICE, AND BULLION VALUE OF THE SILVER DOLLAR OF SILVER PURCHASED UNDER ACT OF FEBRUARY 28, 1878.

Fiscal year.	Ounces, fine.	Cost.	Average price per ounce, fine.	Bullion value of a silver dollar.
1878	10,809,350.58	$13,023,268.96	$1.2048	$0.9318
1879	19,248,086.09	21,593,642.99	1.1218	.8676
1880	22,057,862.64	25,235,081.53	1.1440	.8848
1881	19,709,227.11	22,327,874.75	1.1328	.8761
1882	21,190,200.87	24,054,480.47	1.1351	.8779

AMOUNT, COST, AVERAGE PRICE, AND BULLION VALUE OF THE SILVER DOLLAR OF SILVER PURCHASED UNDER ACT OF FEBRUARY 28, 1878—Continued.

Fiscal year.	Ounces fine.	Cost.	Average price per ounce, fine.	Bullion value of a silver dollar.
1883	22,889,241.24	$25,577,327.58	$1.1174	$0.8642
1884	21,922,951.52	24,378,383.91	1.1120	.8600
1885	21,791,171.61	23,747,460.25	1.0897	.8428
1886	22,690,652.94	23,448,960.01	1.0334	.7992
1887	26,490,008.04	25,988,620.46	.9810	.7587
1888	25,386,125.32	24,237,553.20	.9547	.7384
1889	26,468,861.03	24,717,853.81	.9338	.7222
1890	27,820,900.05	26,899,326.33	.9668	.7477
1891	2,797,379.52	3,049,426.46	1.0901	.8431
Total	291,272,018.56	308,279,260.71	1.0583	.8185

AMOUNT, COST, AVERAGE PRICE, AND BULLION VALUE OF THE SILVER DOLLAR OF SILVER PURCHASED UNDER ACT OF JULY 14, 1890.

Fiscal year.	Ounces, fine.	Cost.	Average price per ounce, fine.	Bullion value of a silver dollar.
1891	48,393,113.05	$50,577,498.44	$1.0451	$0.8083
1892	54,355,748.10	51,106,607.96	.9402	.7271
1893	54,008,162.60	45,531,374.53	.8430	.6520
1894	11,917,658.78	8,715,521.32	.7313	.5656
Total	168,674,682.53	155,931,002.25	.9244	.7150

AMOUNT, COST, AVERAGE PRICE, AND BULLION VALUE OF THE SILVER DOLLAR OF SILVER PURCHASED UNDER THE ACTS OF FEBRUARY 12, 1873, JANUARY 14, 1875, FEBRUARY 28, 1878, AND JULY 14, 1890.

Acts authorizing.	Ounces, fine.	Cost.	Average price per ounce, fine.	Bullion value of a silver dollar.
February 12, 1873	5,434,282.00	$7,152,564.00	$1.3162	$1.0180
January 14, 1875	31,603,906.00	37,571,148.00	1.1888	.9194
February 28, 1878	291,272,018.56	308,279,260.71	1.0583	.8185
July 14, 1890	168,674,682.53	155,931,002.25	.9244	.7150
Total	496,984,889.09	508,933,974.96	1.0240	.7920

BALANCE OF SILVER BULLION PURCHASED UNDER ACT OF JULY 14, 1890, ON HAND AT EACH MINT JANUARY 1, 1897.

Mints.	Ounces, fine.	Cost.
Philadelphia	111,180,257.83	$100,632,007.21
San Francisco	7,003,251.45	6,270,937.79
New Orleans	3,514,375.51	3,017,696.53
Carson	567,981.47	454,710.95
Total	122,265,866.26	110,375,352.48

TABLE SHOWING QUANTITY OF SILVER PURCHASED AND COST OF SAME FOR SUBSIDIARY COINAGE DURING THE CALENDAR YEAR 1896.

Stock.	Ounces, fine.	Cost.
Partings, charges, and fractions purchased	153,430.33	$102,286.87
Mutilated coins, including melted assay coins purchased	2,761.12	2,240.10
Surplus bullion purchased	5,127.99	3,391.14
Total	161,319.44	107,918.11

TABLE SHOWING THE QUANTITY AND COST OF SILVER PURCHASED AT EACH MINT FOR THE SUBSIDIARY COINAGE DURING THE CALENDAR YEAR 1896.

Mint.	Ounces, fine.	Cost.
Philadelphia	110,087.29	$73,793.73
San Francisco	45,257.80	30,141.89
New Orleans	4,369.92	2,913.23
Carson	1,604.43	1,069.26
Total	161,319.44	107,918.11

IMPORTS AND EXPORTS OF GOLD AND SILVER.

GOLD.—Foreign gold bullion of the value of $21,392,343 was imported into the United States during the calendar year 1896, of which amount $15,444,601 came from England, $3,261,255 from Mexico, $1,090,021 from France, $802,986 from the Dominion of Canada, $368,192 from South American States, $66,803 from Germany, and the remainder from the West Indies.

Foreign gold coin of the value of $15,556,496 was imported, of which $8,395,084 came from Australasia, $6,001,343 from Cuba, $451,833 from England, $119,000 from Germany, $96,741 from France, $183,016 from the South American States, $119,815 from the Dominion of Canada, $89,811 from Mexico, and the remainder from the Central American States and the West Indies.

Foreign gold ores of the value of $312,218 were imported, of which $213,065 came from Mexico, and $59,244 from British Columbia.

Gold contained in base bullion, of the value of $555,396, was imported from Mexico, and gold contained in silver ores, of the value of $1,194,648, was also imported, of which amount $449,482 came from Mexico, and $745,166 from British Columbia. The amount imported in copper regulus ($11,652) came from British Columbia.

United States gold coins of the value of $65,711,098 were imported, of which $35,573,630 came from England, $17,519,496 from France, $5,566,103 from the Dominion of Canada, $3,487,900 from Germany, $1,500,798 from Cuba, $562,563 from Haiti, $341,360 from Mexico, $500,898 from the South American States, $439,269 from the West Indies, $98,719 from Japan, and the remainder from the Central American States.

The following table shows the total gold imports for the year:

GOLD IMPORTS, CALENDAR YEAR 1896.

Items.	Amounts.
Foreign bullion	$21,392,343
Foreign coin	15,556,496
Foreign ores	312,218
In foreign base bullion	555,396
In foreign silver-lead ores	1,194,648
In copper regulus	11,652
Total foreign	39,022,753
United States coin	65,711,098
Total gold imports	104,733,851

The value of domestic gold bullion bearing the stamp of a United States mint or assay office exported was $17,081,328, of which amount $9,550,516 went to England, $5,204,151 to France, $2,316,341 to Germany, and $10,320 to the Dominion of Canada. The value of other domestic gold bullion exported was $123,409, of which $97,047 went to Canada, $16,400 to England, $5,660 to Germany, and $4,302 to Hongkong.

United States gold coin of the value of $38,794,637 was exported; of this amount $26,728,575 went to Germany, $4,724,786 to the Dominion of Canada, $2,000,500 to France, $2,661,925 to the South American States, $1,065,278 to the Hawaiian Islands, $972,153 to the West Indies, $350,000 to England, $119,962 to British Columbia, $89,632 to Hongkong, and $71,225 to the Central American States.

The value of gold contained in base bullion, ore, and copper matte exported from the ports of Baltimore and New York was $209,621; of this amount $143,617 went to England and $65,998 to Germany.

The value of foreign gold bullion reexported to England was $546.

The value of foreign gold coin reexported was $2,047,383, of which $1,269,890 went to France, $481,900 to the Dominion of Canada, $178,892 to Venezuela, and the remainder to Mexico and Cuba.

The value of the gold in foreign base bullion reexported to England was $5,584.

The following table shows the total gold exports for the year:

GOLD EXPORTS, CALENDAR YEAR 1896.

Items.		Amount.
United States bars		$17,081,328
Other bullion		123,409
United States coin		38,794,637
In base bullion, ore, and copper matte		209,621
Total domestic		56,208,995
Foreign bullion reexported	$546	
Foreign coin reexported	2,047,383	
In foreign base bullion	5,584	
Total foreign		2,053,513
Total gold exports		58,262,508

SILVER.—Foreign silver bullion of the commercial value of $3,790,461 was imported, of which $3,268,848 came from Mexico and $494,330 from Honduras.

Foreign coin of the value of $7,869,474 was imported, of which $6,005,741 came from Mexico, $670,817 from the Central American States, $460,544 from the South American States, $392,781 from the West Indies, and $321,384 from British Honduras.

Foreign silver ores of the invoiced value of $478,937 were imported, of which $400,176 came from Peru and $52,848 from Mexico. There was also imported from British Columbia silver in copper regulus of the value of $249,453.

United States silver coins of the value of $160,782 were imported, of which $84,282 came from the Dominion of Canada, $27,014 from the South American States, and $28,361 from Mexico and the West Indies.

The invoiced value of silver imported in foreign base bullion and silver-lead ores was $17,633,610. Of this amount $15,543,568 came from Mexico and $2,081,392 from British Columbia.

There were contained in the base bullion and silver-lead ores 85,743,272 pounds of lead, of the value of $1,011,432, and 7,436,956 pounds of copper, of the value of $535,948.

The following table is presented, showing the quantity and value of the metals contained in the base bullion and ores imported during the year:

IMPORTS OF BASE BULLION, COPPER REGULUS, AND SILVER LEAD ORE INTO THE UNITED STATES DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896, AND THEIR METALLIC CONTENTS.

Customs districts.	Weight and value of base bullion, copper regulus, and silver lead ore imported.							
	Lead bullion.		Copper regulus.		Base bullion.		Silver lead ore.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
From Mexico:								
Arizona	.....	.....	.....	.....	341,209	$19,024	17,420,410	$1,621,840
Corpus Christi	.....	.....	.....	.....	4,491,017	775,281	31,137	2,151
Galveston	.....	.....	.....	.....	1,092,231	84,146	243,704	15,560
Paso del Norte	448,774	$3,439	130,457	$9,042	100,975	713	195,159,049	3,565,658
Pittsburg	1,613,551	152,025	.....	.....	15,907,381	1,677,016	1,643,440	157,202
Omaha	.....	.....	.....	.....	.....	.....	1,459,680	44,069
Saluria	.....	.....	.....	.....	9,323,542	797,759	3,570,160	110,339
San Francisco	.....	.....	.....	.....	.....	.....	6,264,507	585,774
New York	.....	.....	.....	.....	(a)	7,785,625	.....	.....
Total from Mexico	2,062,325	155,464	130,457	9,042	31,256,355	11,139,564	225,792,087	6,102,593
From British Columbia:								
Kansas City	.....	.....	4,396,091	475,037	.....	.....	1,520,633	54,817
Montana and Idaho	.....	.....	.....	.....	.....	.....	8,342,037	290,957

a No information furnished.

IMPORTS OF BASE BULLION, COPPER REGULUS, AND SILVER LEAD ORE INTO THE UNITED STATES DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896, AND THEIR METALLIC CONTENTS—Continued.

Customs districts.	Weight and value of base bullion, copper regulus, and silver lead ore imported.							
	Lead bullion.		Copper regulus.		Base bullion.		Silver lead ore.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
From British Columbia—Continued.								
Omaha	.....	.....	.....	.....	.....	.....	12,311,500	$572,749
Puget Sound	.....	.....	.....	.....	2,405,114	$125,655	44,798,341	2,253,828
Total from British Columbia	.....	.....	4,396,091	$475,037	2,405,114	125,655	66,972,511	3,172,351
From Australasia:								
Puget Sound	.....	.....	.....	.....	.....	.....	2,292,640	12,433
Total from Australasia	.....	.....	.....	.....	.....	.....	2,292,640	12,433
Total imports	2,062,325	$155,464	4,526,548	484,079	33,661,469	11,265,219	295,057,238	9,287,377

Customs districts.	Metallic contents of the importation.							
	Gold.		Silver.		Lead.		Copper.	
	Ounces.	Value.	Ounces.	Value.	Pounds.	Value.	Pounds.	Value.
From Mexico:								
Arizona	11,489	$231,800	2,132,547	$1,370,688	2,368,212	$24,360	280,186	$14,016
Corpus Christi	1,743	36,120	687,432	461,885	1,423,235	36,954	3,021,287	242,473
Galveston	270	5,584	94,130	60,310	1,318,270	33,812	.....	.....
Paso del Norte	15,604	296,619	4,671,438	3,019,268	24,651,869	215,955	563,891	47,010
Pittsburg	.....	.....	2,633,526	1,835,670	18,882,096	150,573	.....	.....
Omaha	.....	.....	82,590	43,856	15,370	213	.....	.....
Saluria	4,177	79,955	1,361,220	761,547	8,351,243	66,596	.....	.....
San Francisco	1,752	35,036	776,797	524,483	919,759	26,125	5,189	130
New York	15,988	319,764	10,979,207	7,465,861	.....	.....	.....	.....
Total from Mexico	51,023	1,004,878	23,418,887	15,543,568	57,930,054	554,588	3,870,553	303,629
From British Columbia:								
Kansas City	632	12,635	563,490	367,136	910,133	13,064	1,984,741	137,019
Montana and Idaho	.....	.....	279,298	188,278	4,541,287	102,679	.....	.....
Omaha	.....	.....	677,882	452,585	6,693,278	120,164	.....	.....
Puget Sound	37,060	744,183	1,965,016	1,322,846	15,324,624	217,154	1,581,662	95,300
Total from British Columbia	37,692	756,818	3,485,686	2,330,845	27,469,322	453,061	3,566,403	232,319
From Australasia:								
Puget Sound	.....	.....	14,416	8,650	343,896	3,783	.....	.....
Total from Australasia	.....	.....	14,416	8,650	343,896	3,783	.....	.....
Total imports	88,715	1,761,696	26,918,989	17,883,063	85,743,272	1,011,432	7,436,956	535,948

IMPORTS OF BASE BULLION, COPPER REGULUS, AND SILVER LEAD ORE INTO THE UNITED STATES DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896, AND THEIR METALLIC CONTENTS—Continued.

RECAPITULATION OF IMPORTS OF BASE BULLION, 1896.

Description.	From Mexico.		From British Columbia.		From Australasia.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Lead bullion	2,062,325	$155,464	.....	.....	.....	.....	2,062,325	$155,464
Copper regulus	130,457	9,042	4,396,091	$475,037	.....	.....	4,526,548	484,079
Base bullion	31,256,355	11,139,564	2,405,114	125,655	.....	.....	33,661,469	11,265,219
Silver-lead ore	225,792,087	6,102,593	66,972,511	3,172,351	2,292,640	$12,433	295,057,238	9,287,377
Total	259,241,224	17,406,663	73,773,716	3,773,043	2,292,640	12,433	335,307,580	21,192,139

METALLIC CONTENTS OF IMPORTATION OF BASE BULLION, 1896.

Description.	From Mexico.		From British Columbia.		From Australasia.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Gold ..... ounces	51,023	$1,004,878	37,692	$756,818	.....	.....	88,715	$1,761,696
Silver ..... do	23,418,887	15,543,568	3,485,686	2,330,845	14,416	$8,650	26,918,989	17,883,063
Lead ..... pounds	57,930,054	554,588	27,469,322	453,061	343,896	3,783	85,743,272	1,011,432
Copper ..... do	3,870,553	303,629	3,566,403	232,319	.....	.....	7,436,956	535,948
Total	.....	17,406,663	.....	3,773,043	.....	12,433	.....	21,192,139

The following table shows the total silver imports for the year:

SILVER IMPORTS, CALENDAR YEAR 1896.

Item.	Amount.
Foreign bullion (commercial value)	$3,790,461
Foreign coin	7,869,474
Foreign ores (commercial value)	478,937
In foreign base bullion (commercial value)	11,156,113
In foreign silver-lead ores (commercial value)	6,477,497
In copper regulus (commercial value)	249,453
Total foreign	30,021,935
United States coin	160,782
Total silver imports	30,182,717

Domestic silver bullion, bearing the stamp of a United States mint or assay office, valued at $90,447 (135,455 ounces), was exported, nearly all of which went to England. Other silver bullion of the value of $56,112,697 (83,676,273 ounces) was exported, of which amount $46,228,419 went to England, $3,867,292 to France, $3,556,358 to Japan, $1,535,190 to China, $525,100 to Hongkong, and $323,198 to Guatemala.

Domestic silver coins of the value of $115,989 were exported, of which $73,900 went to the Hawaiian Islands, $22,000 to Haiti, $10,951 to British Columbia, and $7,886 to Canada.

Silver in base bullion, ore, and copper matte of the value of $1,712,412 was exported from the ports of New York and Baltimore to England.

The following statements from the collectors of customs at the ports of New York and Baltimore, and the superintendent of the United States assay office at New York, relative to the amount of gold and silver exported in copper matte during the year, are presented:

OFFICE OF THE COLLECTOR OF CUSTOMS,
Port of Baltimore, Md., April 28, 1897.

SIR: In compliance with your request of the 27th instant, I have the honor to inclose herewith a statement of the amount of gold and silver contained in copper matte exported from this port during the calendar year ended December 31, 1896. The records of this office do not indicate that there was any pig copper, or other ore containing gold and silver, exported during the above-mentioned period.

Respectfully, yours,

JAMES A. DIFFENBAUGH,
Special Deputy Collector.

The DIRECTOR OF THE MINT,
Washington, D. C.

ABSTRACT OF SILVER-COPPER MATTE EXPORTED FROM THE PORT OF BALTIMORE, MD., DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896, CALCULATED ON A BASIS OF 60.5 PURE COPPER, 35 OUNCES PURE SILVER, AND 0.14 OUNCE PURE GOLD.

Months.	Matte.		Pure copper.	Pure silver.	Pure gold.
1896.	*Pounds.*	*Tons.*	*Pounds.*	*Ounces.*	*Ounces.*
January	896,000	400	542,080	14,000	56
February	448,000	200	271,040	7,000	28
Total	1,344,000	600	813,120	21,000	84

OFFICE OF THE COLLECTOR OF CUSTOMS,
Port of New York, April 29, 1897.

SIR: In reply to your letter of the 27th instant I would state that you will find inclosed herewith a statement of the gold and silver contained in pig copper, copper matte, etc., exported from this port during the calendar year ending December 31, 1896.

Respectfully, yours,

JAMES F. KILBRETH, *Collector.*

The DIRECTOR OF THE MINT,
Washington, D. C.

SILVER AND GOLD CONTAINED IN COPPER MATTE.

Month.	Silver.	Gold.
1896.		
January	$75,290	$3,960
February	33,425	6,580
March	67,568	17,940
April	14,665	5,420
May	35,807	7,022
June	95,368	13,470
July	33,652	3,380
August	25,387	2,440
September	168,880	13,094
October	179,046	24,839
November	148,232	31,961
December	101,285	6,820
Total	978,605	136,926

THE UNITED STATES ASSAY OFFICE AT NEW YORK,
Superintendent's Office, June 2, 1897.

SIR: As requested in your letter of April 27, I give below a statement showing the amount of gold and silver contained in pig copper, copper matte, etc., exported from the port of New York during the calendar year 1896, viz, 52,746,239 pounds, containing 2,519,670 fine ounces of silver and 6,620 fine ounces of gold.

Respectfully, yours,

ANDREW MASON, *Superintendent.*

The DIRECTOR OF THE MINT,
Washington, D. C.

THE UNITED STATES ASSAY OFFICE IN NEW YORK,
SUPERINTENDENT'S OFFICE,
June 9, 1897.

SIR: Your telegram of this date received. In reply to your letter of the 3d instant, asking for some explanation as to the wide difference in the statements as furnished by the collector of customs at New York and this office, I have to report, after further conference at the custom-house, that the difference arises from the failure of the exporters to report there any gold or silver in pig copper in any case, and in many cases the amount contained in copper matte, etc. Probably they have been unable to do it at the time of shipment, and overlooked it afterwards. I have been assured by the exporters that the figures as given in my statement of June 2 are correct.

Respectfully, yours,

ANDREW MASON,
Superintendent.

The DIRECTOR OF THE MINT,
Washington, D. C.

Foreign silver bullion of the value of $8,220 (12,088 ounces) was reexported to England. Foreign silver coin of the value of $6,736,485 was reexported, of which amount $2,720,446 went to Hongkong, $1,953,176 to England, $1,000,996 to China, $417,352 to the West Indies, $186,338 to Japan, $104,005 to Canada, $191,407 to Mexico, $58,200 to France, $59,144 to the South American States, and the remainder to the Central American States. Silver in foreign base bullion and ore, valued at $61,040, was reexported to England. The following table shows the total silver exports for the year:

SILVER EXPORTS, CALENDAR YEAR 1896.

Item.		Amount.
United States bars		$90,447
Other bullion		56,112,697
United States coin		115,989
In base bullion, ore, and copper matte		1,712,412
Total domestic		58,031,545
Foreign bullion reexported	$8,220	
Foreign coin reexported	6,736,485	
In foreign base bullion and ore	61,040	
Total foreign		6,805,745
Total silver exports		64,837,290

In the above table the item "in copper matte, $1,712,412," ascertained by the Bureau of the Mint from the superintendent of the United States assay office at New York and the collector of customs

at Baltimore (see the correspondence above), has been substituted for the amount of silver exported in the form of copper matte contained in the custom-house record, viz, $992,675.

In the appendix will be found tables exhibiting the imports and exports of the previous metals, by customs districts and by countries, for the calendar year 1896.

MOVEMENT OF GOLD FROM THE UNITED STATES.

The superintendent of the United States assay office at New York has kindly prepared the following tables, giving exports of gold through the port of New York during the calendar year 1896:

STATEMENT OF UNITED STATES GOLD COIN AND GOLD BULLION EXPORTED TO EUROPE FROM THE PORT OF NEW YORK DURING THE CALENDAR YEAR 1896.

Date.	Country.	Value.	Rate of exchange.	Date.	Country.	Value.	Rate of exchange.
January 3	England	$1,020,542	$4.89¼	June 3	Germany	$500,000	$4.88½
January 7	do	2,123,620	4.89¼	June 8	do	100,000	4.88½
January 8	do	603,675	4.89¼	June 10	do	100,000	4.88½
January 10	do	1,263,988	4.89	June 12	do	1,450,000	4.88½
January 14	do	1,101,916	4.89¼	Do	France	750,000	4.88½
January 17	do	1,011,676	4.89¼	June 15	Germany	450,000	4.88½
January 21	do	2,525,099	4.89	June 16	do	400,000	4.88½
April 6	Germany	800,000	4.89¼	June 20	do	750,000	4.88¼
April 8	do	500,000	4.89¼	June 26	France	200,000	4.88¼
April 13	do	700,000	4.89	June 29	do	1,050,000	4.88¼
April 20	do	200,000	4.88¾	July 1	do	200,000	4.88¼
April 24	France	500	4.88¾	July 3	England	3,000	4.88
May 1	do	1,451,691	4.88¾	July 10	Germany	200,000	4.88
May 4	Germany	2,150,000	4.88¾	July 13	do	375,000	4.88¼
May 6	do	2,200,000	4.88¾	July 15	do	900,000	4.88¾
May 8	France	1,507,207	4.88¾	July 17	England	250,000	4.88¾
May 11	England	2,050,000	4.88¾	Do	France	1,791,228	4.88¾
May 13	Germany	1,500,575	4.88¾	July 20	Germany	1,553,506	4.88¾
May 15	do	1,000,000	4.88¾	Do	do	1,480,000	4.88¾
May 16	do	1,100,000	4.88¾	July 21	do	6,000	4.88¾
May 20	do	500,000	4.88¾	July 22	do	1,250,000	4.88¾
May 22	France	1,000,000	4.88¾	Do	do	762,835	4.88¾
May 23	Germany	100,000	4.88¾	July 24	do	7,000	4.88½
May 25	do	1,550,000	4.88¾	August 3	do	5,000	4.89
May 27	do	1,250,000	4.88¾	August 7	do	5,000	4.89
May 29	do	1,105,780	4.88¾	December 10	England	500	4.86½
Do	France	704,025	4.88¾	Total		46,159,363	
May 30	Germany	600,000	4.88¾				

RECAPITULATION OF GOLD EXPORTS TO EUROPE.

Description.	England.	Germany.	France.
United States coin	$350,000	$26,728,575	$2,000,500
United States mint and assay office bars	9,550,516	2,316,341	5,204,151
Foreign coin		1,440	1,269,890
Bullion (unknown)	16,400	5,660	
Total	9,916,916	29,052,016	8,474,541

Grand total shipments to Europe $47,443,473.

During the same period there were shipped to Mexico, West Indies, and Central and South America the following:

United States coin	$3,678,615
Foreign coins	294,153
Total	3,972,768
Grand total of exports	51,416,241

THE COURSE OF SILVER DURING THE CALENDAR YEAR 1896.

During the calendar year 1896 the London price of silver did not fluctuate so widely as in 1895; the highest price was 31 15/16 d. for silver .925 fine (British standard), equal to $0.70 per ounce, 1,000 fine. The lowest price 29 3/4 d., equal to $0.65 per ounce fine, the average of the year being 30 3/4 d., or equal to $0.6756 per ounce fine. All through the year India bought silver steadily, except for a short period in October, when on account of the famine and the uncertainty arising therefrom the purchase of silver by the bazaars ceased for a time. Aside from the steady purchases of India, there was a good demand from continental countries, and from time to time there were also shipments for Japan.

The amount of silver sold in the London market during 1896 was greater by nearly $10,000,000 than in 1895, the chief excess in the supply coming from the United States, which was in a measure due to the increase in the amount of silver obtained from ores imported from Mexico and British Columbia, and smelted and refined in the United States.

At the average London price of silver for the year, the bullion value of the silver dollar was $0.52158, and the commercial ratio of gold to silver was as 1 to 30.66.

HIGHEST, LOWEST, AND AVERAGE PRICE OF SILVER BULLION AND VALUE OF A FINE OUNCE EACH MONTH DURING THE CALENDAR YEAR 1896.

Month.	Highest.	Lowest.	Average price per ounce, British standard, 0.925.	Equivalent value of a fine ounce with exchange at par, $4.8665.	Average monthly price at New York of exchange on London.	Equivalent value of a fine ounce based on average monthly price and average rate of exchange.	Average monthly New York price of fine bar silver.
1896.	*Pence.*	*Pence.*	*Pence.*				
January	30 7/8	30 1/2	30.6490	$0.67186	$4.8905	$0.67518	$0.68173
February	31 9/16	30 3/4	30.9925	.67939	4.8786	.68104	.68811
March	31 15/16	31 1/8	31.3726	.68772	4.8818	.68988	.69519
April	31 3/16	30 13/16	31.0601	.68087	4.8890	.68401	.69062
May	31 1/4	30 15/16	31.0781	.68126	4.8885	.68851	.69046
June	31 9/16	31 3/16	31.4038	.68840	4.8842	.69091	.69730
July	31 1/2	31 3/8	31.4399	.68919	4.8896	.69185	.69803
August	31 3/8	30 5/8	30.9593	.67866	4.8681	.67879	.68558
September	30 11/16	30	30.3400	.66508	4.8417	.66169	.66925
October	30 5/16	29 3/4	30.0347	.65840	4.8435	.65528	.66277
November	30	29 13/16	29.9212	.65590	4.8572	.65470	.66065
December	30	29 13/16	29.9125	.65571	4.8768	.65605	.66370
Average			30.7636	.67437	4.8741	.67565	.68195

STOCK OF MONEY IN THE UNITED STATES.

The following estimate of the stock of United States coin in the country on January 1, 1897, is presented:

OFFICIAL TABLE OF STOCK OF COIN IN THE UNITED STATES JANUARY 1, 1897.

Item.	Gold.	Silver.	Total.
Estimated stock of coin Jan. 1, 1896	$567,055,957	$500,438,966	$1,067,494,923
Coinage, calendar year 1896	47,053,060	23,089,899	70,142,959
Net imports of United States coin, calendar year 1896	27,516,861	44,793	27,561,654
Total	641,625,878	523,573,658	1,165,199,536
Loss:			
United States coin melted for recoinage, calendar year 1896	1,939,173	4,552,051	6,491,224
United States coin used in the arts, calendar year 1896 (estimated)	1,500,000	100,000	1,600,000
Total	3,439,173	4,652,051	8,091,224
Estimated stock of coin Jan. 1, 1897	638,186,705	518,921,607	1,157,108,312

NOTE.—Of the silver coins $443,166,391 were in dollars, and $75,755,216 were in subsidiary coins.

The coins melted for recoinage represent nominal values.

A table will be found in the Appendix, showing from what source these amounts were obtained. The value of the gold and silver bullion owned by the Government on January 1, 1897, was as follows:

GOLD AND SILVER BULLION IN MINTS AND ASSAY OFFICES JANUARY 1, 1897.

Metal.	Cost value.
Gold	$54,648,743
Silver	112,264,226
Total	166,912,969

The Mercantile Safe Deposit Company, in New York, on January 1, 1897, held 480,081 fine ounces of silver bullion, valued at $312,052.

The total metallic stock of the United States, consisting of the stock of coin, the bullion owned by the Government, and the bullion held by the Mercantile Safe Deposit Company, was as follows:

METALLIC STOCK JANUARY 1, 1897.

Coin and bullion.	Amount.
Gold	$692,835,448
Silver (bullion in mints and held by Mercantile Safe Deposit Company)	631,497,885
Total	1,324,333,333

On January 1, 1896, the estimated metallic stock was as follows:

METALLIC STOCK JANUARY 1, 1896.

Coin and bullion.	Amount.
Gold	$596,499,912
Silver (bullion in mints and held by Mercantile Safe Deposit Company)	625,230,574
Total	1,221,730,486

By comparing the above tables it will be seen that the stock of gold increased $96,335,536, and silver $6,267,311, a total increase of $102,602,847, during the calendar year.

The table following shows the stock of metallic and paper money in the United States on January 1, 1897:

LOCATION OF THE MONEYS OF THE UNITED STATES JANUARY 1, 1897.

Moneys.	In Treasury.	Outside of Treasury.	Total.
Metallic:			
Gold bullion	$54,648.743		$54,648,743
Silver bullion	112,264,226	$312,052	112,576,278
Gold coin	121,745,884	516,440,821	638,186,705
Silver dollars	384,892,114	58,274,277	443,166,391
Subsidiary silver coin	14,250,909	61,504,307	75,755,216
Total	687,801,876	636,531,457	1,324,333,333
Paper:			
Legal-tender notes, old issue	87,127,493	259,553,523	346,681,016
Legal-tender notes, act July 14, 1890	35,452,100	84,364,180	119,816,280
Gold certificates	1,393,510	37,886,279	39,279,789
Silver certificates	14,020,571	356,862,933	370,883,504
National-bank notes	14,315,739	221,347,379	235,663,118
Currency certificates	530,000	50,770,000	51,300,000
Total	152,839,413	1,010,784,294	1,163,623,707
Grand total	840,641,289	1,647,315,751	2,487,957,040

The total amount of money in circulation in the United States on January 1, 1897, was $1,647,315,751, while the amount on January 1, 1896, was $1,576,352,473, showing an increase in the circulation of $70,963,278, on January 1, 1897.

GOLD AND SILVER USED IN THE INDUSTRIAL ARTS IN THE UNITED STATES.

As in former years, this Bureau has ascertained the amount of gold and silver used in the industrial arts in the United States during the calendar year 1896, by making inquiries of all the private refineries and the Government institutions. Statements were received in answer to these inquiries showing the number of fine ounces and the value of gold and silver bars sold to manufacturers and jewelers for industrial

use, and also the class of material used in the manufacture of such bars. The number of fine ounces and value of gold and silver bars furnished manufacturers and jewelers by the United States assay office at New York during the calendar year 1896 was as follows:

STATEMENT OF BARS MANUFACTURED FOR USE IN THE INDUSTRIAL ARTS BY THE UNITED STATES ASSAY OFFICE AT NEW YORK DURING THE CALENDAR YEAR 1896.

Material used.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Coining value.
Domestic bullion	292,803.973	$6,052,795.30	3,543,854.73	$4,581,953.58
Foreign material	15,325.370	316,803.52	821,386.99	1,061,995.30
Old jewelry, etc	68,403.400	1,414,023.77	435,661.24	563,279.18
United States coin	.....	.....	474.12	613.00
Total	376,532.743	7,783,622.59	4,801,377.08	6,207,841.06

The number of fine ounces and value of gold and silver bars furnished manufacturers and jewelers by the United States Mint at Philadelphia during the calendar year 1896 was as follows:

VALUE AND COMPOSITION OF BARS MANUFACTURED FOR USE IN THE INDUSTRIAL ARTS BY THE UNITED STATES MINT AT PHILADELPHIA DURING THE CALENDAR YEAR 1896.

Material used.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Coining value.
Domestic bullion	25,874.452	$534,872.40	.....	.....
United States coin	763.791	15,788.96	85.50	$110.55
Jewelry, etc	3,717.599	76,849.59	51,513.16	66,602.86
Total	30,355.842	627,510.95	51,598.66	66,713.41

The number of fine ounces and value of gold and silver bars furnished manufacturers and jewelers by the private refineries during the calendar year 1896 was as follows:

BARS FOR INDUSTRIAL USE FURNISHED GOLDSMITHS AND OTHERS BY PRIVATE REFINERIES DURING THE CALENDAR YEAR 1896.

Material used.	Gold bars manufactured.		Silver bars manufactured.	
	Fine ounces.	Value.	Fine ounces.	Coining value.
Domestic bullion (exclusive of United States bars)	30,095	$622,119	2,616,922	$3,383,495
United States bars	19,617	405,519	867,990	1,122,250
United States coin	7,845	162,171	.....	.....
Old plate, jewelry, and other old material	42,496	878,470	345,686	446,947
Total	100,053	2,068,279	3,830,598	4,952,692

Number of firms addressed, 56; number replying, 50; number not manufacturing, 25; number manufacturing, 25.

The United States bars bearing the stamp of a United States mint or assay office are manufactured by Government institutions and are included in their tables. In order to avoid duplication, they must be eliminated from the amounts reported by private refineries.

The number of fine ounces and value of gold and silver bars, exclusive of United States bars, furnished manufacturers and jewelers by the private refineries, during the calendar year 1896, was as follows:

BARS FOR INDUSTRIAL USE (EXCLUSIVE OF GOVERNMENT BARS) FURNISHED GOLDSMITHS AND OTHERS BY PRIVATE REFINERIES DURING THE CALENDAR YEAR 1896.

Material used.	Gold bars manufactured.		Silver bars manufactured.	
	Fine ounces.	Value.	Fine ounces.	Coining value.
Domestic bullion	30,095	$622,119	2,616,922	$3,383,495
United States coin	7,845	162,171	.....	.....
Old plate, jewelry, and other old material	42,496	878,470	345,686	446,947
Total	80,436	1,662,760	2,962,608	3,830,442

The value of gold and silver bars furnished manufacturers and jewelers by Government institutions and private refineries during the calendar year 1896 was as follows:

GOLD AND SILVER BARS FURNISHED FOR USE IN MANUFACTURES AND THE ARTS DURING THE CALENDAR YEAR 1896, AND CLASSIFICATION OF THE MATERIAL USED.

Material used.	Gold.	Silver, coining value.	Total.
Domestic bullion	$7,209,787	$7,965,449	$15,175,236
United States coin	177,960	723	178,683
Old material	2,369,343	1,076,829	3,446,172
Foreign bullion and coin	316,804	1,061,995	1,378,799
Total	10,073,894	10,104,996	20,178,890

The value of gold and silver bars furnished manufacturers and jewelers by Government institutions and private refineries during the calendar year 1895 was as follows:

GOLD AND SILVER BARS FURNISHED FOR USE IN MANUFACTURES AND THE ARTS DURING THE CALENDAR YEAR 1895, AND CLASSIFICATION OF THE MATERIAL USED.

Material used.	Gold.	Silver, coining value.	Total.
Domestic bullion	$8,481,789	$9,825,387	$18,307,176
United States coin	212,046	1,791	213,837
Foreign bullion and coin	471,027	973,501	1,444,528
Old material	2,976,269	1,378,136	4,354,405
Total	12,141,131	12,178,815	24,319,946

By comparing the above tables it will be seen that the amount of gold used in the industrial arts during the calendar year 1896 decreased $2,067,237 and silver $2,073,819, a total decrease of $4,141,056.

The United States coin used in the manufacture of bars for industrial purposes, as reported by private refineries and Government institutions, was, gold, $177,960; silver, $723. The actual amount of United States coin melted down by goldsmiths and jewelers would not appear in the reports of institutions manufacturing bars, and, in fact, is not known; but, assuming the total amount of United States gold coin used in the arts to be $1,500,000 and silver $100,000, the industrial consumption of the precious metals in the United States during the calendar year 1896 would be as follows.

INDUSTRIAL CONSUMPTION OF THE PRECIOUS METALS DURING THE CALENDAR YEAR 1896.

Material used.	Gold.	Silver (coining value).	Total.
Domestic bullion	$7,209,787	$7,965,449	$15,175,236
United States coins	1,500,000	100,000	1,600,000
Old material	2,369,343	1,076,829	3,446,172
Foreign bullion and coin	316,804	1,061,995	1,378,799
Total	11,395,934	10,204,273	21,600,207

GOLD BARS EXCHANGED FOR GOLD COIN AT THE MINT AT PHILADELPHIA AND ASSAY OFFICE AT NEW YORK DURING THE CALENDAR YEAR 1896.

Month.	Philadelphia.	New York.	Total.
January	$65,422.86	$9,635,106.97	$9,700,529.83
February	55,268.53	547,417.13	602,685.66
March	60,264.24	591,195.32	651,459.56
April	40,169.00	416,702.31	456,871.31
May	45,189.69	3,799,060.38	3,844,250.07
June	50,210.03	380,210.07	430,420.10
July	37,610.11	4,481,497.10	4,519,107.21
August	20,077.67	319,720.22	339,797.89
September	40,163.21	407,427.14	447,590.35
October	35,144.57	602,981.75	638,126.32
November	45,186.82	546,904.31	592,091.13
December	40,165.67	399,816.47	439,982.14
Total	534,872.40	22,128,039.17	22,662,911.57

All the gold bars ($534,872.40) exchanged for gold coin at Philadelphia, and $6,052,795.30 of the amount of gold bars exchanged for gold coin at New York, under the provisions of the act of May 26, 1882, were employed in the industrial arts. The remainder of the total bars exchanged, viz, $16,075,243.87, was exported.

The following table shows the amounts and the classification of the material used in the industrial arts in the United States each year since 1880:

GOLD AND SILVER BARS FURNISHED FOR USE IN MANUFACTURES AND THE ARTS, AND CLASSIFICATION OF THE MATERIAL USED, DURING THE CALENDAR YEARS 1880–1896.

GOLD.

Calendar year.	United States coin.	New material.	Old material.	Foreign bullion and coin.	Total.
1880	$3,300,000	$6,000,000	$395,000	$1,267,600	$10,962,600
1881	2,700,000	7,000,000	522,900	1,547,800	11,770,700
1882	2,500,000	7,000,000	696,500	671,500	10,868,000
1883	4,875,000	7,840,000	1,549,300	194,500	14,458,800
1884	5,000,000	6,000,000	3,114,500	385,500	14,500,000
1885	3,500,000	6,736,927	1,408,902	178,913	11,824,742
1886	3,500,000	7,003,480	1,928,046	638,003	13,069,529
1887	3,500,000	9,090,342	1,835,882	384,122	14,810,346
1888	3,500,000	9,893,057	2,402,976	718,809	16,514,842
1889	3,500,000	9,686,827	3,218,971	291,258	16,697,056
1890	3,500,000	10,717,472	3,076,426	362,062	17,655,960
1891	3,500,000	10,697,679	4,860,712	628,525	19,686,916
1892	3,500,000	10,588,703	4,468,685	771,686	19,329,074
1893	1,500,000	8,354,482	2,777,165	804,254	13,435,901
1894	1,500,000	6,430,073	2,184,946	543,585	10,658,604
1895	1,500,000	8,481,789	2,976,269	471,027	13,429,085
1896	1,500,000	7,209,787	2,369,343	316,804	11,395,934
Total	52,375,000	138,730,618	39,786,523	10,175,948	241,068,089

SILVER (COINING VALUE).

1880	$600,000	$5,000,000	$145,000	$353,000	$6,098,000
1881	200,000	5,900,000	178,000	371,000	6,649,000
1882	200,000	6,344,300	212,900	440,300	7,197,500
1883	200,000	4,623,700	561,900	155,000	5,540,600
1884	200,000	4,500,000	170,000	650,000	5,520,000
1885	200,000	4,539,875	462,186	62,708	5,264,769
1886	200,000	3,626,195	404,155	825,615	5,055,965
1887	200,000	4,102,734	480,606	654,991	5,438,331
1888	200,000	6,477,857	652,047	771,985	8,101,889
1889	200,000	7,297,933	611,015	657,997	8,766,945
1890	200,000	7,143,635	640,100	1,245,419	9,229,154
1891	200,000	7,289,073	858,126	1,256,101	9,603,300
1892	200,000	7,204,210	647,377	1,249,801	9,301,388
1893	100,000	6,570,737	1,222,836	1,740,704	9,634,277
1894	100,000	8,579,472	1,221,177	982,399	10,883,048
1895	100,000	9,825,387	1,378,136	973,501	12,277,024
1896	100,000	7,965,449	1,076,829	1,061,995	10,204,273
Total	3,400,000	106,990,557	10,922,390	13,452,516	134,765,463

THE WORLD'S INDUSTRIAL CONSUMPTION OF GOLD AND SILVER IN 1896.

The following questions relative to the industrial consumption of gold and silver in the various countries of the world, in 1896, were contained in the list of interrogatories in the last circular of the Bureau of the Mint addressed to foreign governments through our representatives abroad:

No. 3. What was the weight of fine gold used in the industrial arts during the calendar year 1896?

No. 4. What amount of this was new gold and what amount old gold?

No. 5. What was the weight of fine silver used in the industrial arts during the calendar year 1896?

No. 6. What amount of this was new silver and what amount old silver?

The same inquiries were contained in the list of interrogatories in the Bureau's circular for 1895. In the circular for 1893, the first one in which these interrogatories were inserted, and also in that for 1894, they were formulated thus:

No. 3. What was the weight and value of the gold used in the industrial arts during the year?

No. 4. Same question as to silver.

In 1896, as in previous years, by far the larger number of Governments answered: "There were no statistics collected by them on the subject of the employment of the precious metals in the arts," or else "that it was impossible to answer these interrogatories." Partial information on the subject was received from the following countries in 1896: Australasia, British India, Austria-Hungary, France, the Netherlands, Portugal, and Sweden. Switzerland furnished no information regarding its industrial employment of the precious metals in 1896, but did in 1895, and its use of gold and silver in the arts in 1896 can not reasonably be supposed to have differed greatly from what it was in 1895.

It is to be regretted that statistics of the industrial consumption of the precious metals are collected by so few Governments, and also that the information collected by these few is so incomplete and unsatisfactory.

It is only after ascertaining what portion of the gold and silver annually extracted from the mines finds industrial employment, that the amount yearly available for coinage can be determined. There can be no intelligent discussion of the money question until we know how much of the newly produced gold and silver can be given monetary employment every year.

The amount of gold and silver annually taken from the mines is either coined, used for industrial purposes, buried by exportation to the East, or held in the form of bullion by the banks as a part of their reserves. Some small portion may be definitively lost, as by shipwreck or the wear and tear of coins. By far the larger portion is either coined or used for industrial purposes, so that it may be said, in a gen-

eral way, that the annual production of gold and silver is equal to the coinage (exclusive of recoinage and of old material, broken gold and silver, etc., coined) plus the industrial consumption of the metals during the year in question, plus the amount definitively exported to the East.

It is only in comparatively recent years that any governments have concerned themselves with the collection of accurate statistics on the yearly industrial consumption of the precious metals, the United States leading the way. Previously, individuals collected data sufficient to enable them to form more or less reliable estimates of that consumption.

In 1822, Lowe, an Englishman, made an estimate of the amount of gold and silver used in Europe and the United States in the arts every year. Count Cabral, in 1823, made an estimate of the industrial employment of the precious metals, in Paris. Alexander von Humboldt calculated, approximately, the quantity so used in Europe. In 1830 Jacobs gave an estimate of the quantities used in the arts in Europe and the United States. Nebenius made a similar calculation in 1841.

The late eminent Dr. Soetbeer published the first results of his investigations of the subject in 1881. He continued them until his death in 1892, his latest utterances on the subject appearing in 1891.

Professor Lexis, of Goettingen, has devoted much study to the subject, and what he has to say on this, as on all questions relating to the monetary uses of gold and silver, deserves the most respectful consideration. Mr. Ottomar Haupt, of Paris, has labored diligently and successfully in the same field, and the results he has reached command the attention of all statisticians.

The most careful estimate that can be made of the annual industrial consumption of gold and silver is obtained by supplementing the information obtained directly from governments by the trustworthy estimates of such experts as Soetbeer, Lexis, and Haupt. This is the course the Bureau of the Mint has followed since 1893.

The estimates hitherto made by individuals, like those mentioned above, have related only to civilized countries. The industrial consumption of the precious metals in uncivilized countries is not worth considering, especially as the statistician is here concerned only with the employment given to the known annual production, all of which, in the case of gold, finds its way to civilized countries and is there sold.

The amount that goes to India is readily accounted for.

The information received from governments, relative to the use of gold and silver in the arts, in 1896, is as follows:

Australasia.—"Gold used in the industrial arts very small, the melted coin being used. Fine silver (new or old) used in the industrial arts not ascertainable." With these few words the whole subject of industrial employment of the precious metals in one quarter of the world may be almost entirely dismissed.

Austria.—Amount of fine gold and silver (new or old) used in the industrial arts during the calendar year 1896:

	Kilograms.
Domestic gold articles, weighing	3,762.930
Domestic silver articles, weighing	52,326.350

No data are given showing the old gold and silver material used in the foregoing.

In 1895 there was used for industrial purposes gold as follows:

	Kilograms.
Coins	1,986.1978
Gold, alloyed	241.1758
Old gold	141.8598
Pure gold	172.1656
Total	2,541.3990

In 1895 there was used for industrial purposes silver as follows:

	Kilograms.
Coins	591.120
Silver, alloyed	2,004.964
Old silver	2,538.608
Pure silver	49,267.875
Total	54,402.567

Hungary.—No data are on hand to show the amount of gold and silver used for industrial purposes. There were presented at the various stamping offices:

A.—Domestic goods.

	Kilograms.
I. Articles of gold	1,242.863
II. Articles of silver	9,704.899
III. Gold wire	821.700
IV. Silver wire	406.148
V. Gilt wire	51.916

B.—Foreign goods.

VI. Articles of gold	280.176
VII. Articles of silver	2,652.351
VIII. Articles of wire	8.825

Among the foreign goods there were 7,772 gold watches, weighing 122.153 kilograms, and 50,697 silver watches, weighing 1,314.795 kilograms.

No data are on hand as to what amount of that used was new or old gold and silver.

British India.—Estimate of the quantity of gold annually employed in industry: No gold is used for currency in India, and the whole of the gold imported or produced, and not exported, is either hoarded or used in the arts and industries. There are no data from which it would be possible to estimate the quantity which is hoarded and that which is used in the arts and industries. But it may be said generally that but little is hoarded in the form of bars or ignots, most of the gold being made into ornaments and hoarded in that form. Until the closure of the

Indian mints in June, 1893, practically all the silver imported into India (none is ever produced in the country) was coined either in the mints of the Government or in those of the native states. Much of the coin was withdrawn annually from circulation to be hoarded or converted into ornaments, but there are no data, except the imports of silver during the period since the closure of the Government mints, on which to frame an estimate of the quantity actually so withdrawn. But these imports have been substantially affected by speculation arising out of special and transitory conditions, and they form, as yet, an uncertain basis on which to frame an estimate. It is not possible to say what proportion was hoarded in the form of rupees, bars or ingots, and ornaments.

France.—"It is believed that the weight of gold and silver used in the industrial arts during the year 1896 was 20,000 kilograms for gold and 187,000 kilograms for silver. The weight of the objects of gold and silver which were stamped by the Government was 8,597 kilograms for gold and 108,434 kilograms for silver. The Government has no information as to what amount of this was new and what amount was old silver."

Netherlands.—"During the year 1896 new work in gold and silver was presented at the various stamping offices to the following amounts:

	Kilograms.
Fine gold	50
Fine silver	9,220

"It is unknown what was the amount of new or old material used in the above works."

Portugal.—"As estimated by the director of the mint at Lisbon, the weight of fine gold used in the industrial arts during the calendar year 1896 was 1,450 kilograms. No distinction reported between new and old gold. As reported by the director of the mint, the weight of fine silver used in the industrial arts during 1896 was 7,340 kilograms. No distinction made between new and old silver."

Russia.—"The weight of gold employed in the industrial arts in Russia in 1896 was as follows: 5,108.7312923 kilograms of fine gold, representing a value of 17,595,681.7 francs ($3,395,966.57). These data are furnished by the bureau of assay (guaranty duties). As a matter of fact, the gold employed in industry is much larger in amount, for (1) a large number of articles are not presented to be punched or stamped, in order to avoid the payment of credit duties; (2) gold leaf and gold articles weighing less than one-half zolotnik are not required to be punched or stamped; (3) all the parts of gold watches are not required to be presented for stamping, because such stamping might injure the mechanism. Consequently there are no data of the gold employed industrially in the three ways just mentioned. The weight of silver used in the industrial arts during the calendar year 1896 was 126,335.5833949 kilograms of fine silver, representing a value of 28,090,590 francs" ($5,421,483.87 coining value).

Sweden.—"The weight of fine gold used for the manufacture of gold objects in 1896 may be estimated at 369 kilograms, with the addition of imported gold objects, containing fine gold at the rate of 31 kilograms; total, 400 kilograms. The weight of fine gold used for gilding and in other trades is unknown. About half the fine gold employed for the manufacture of gold objects may be supposed to be new gold. The rest has consisted of gold coin, and a small portion has been supplied by old gold objects. The weight of fine silver used in 1896 for the manufacture of silver objects may be calculated at 2,303 kilograms, with the addition of the fine silver contained in imported silver objects at 1,052 kilograms; total, 3,355 kilograms. The weight of fine silver used for silvering and in other trades is unknown. The main portion of the fine silver employed for manufacturing silver objects may be supposed to be new silver."

Supplementing the information given above of the industrial consumption of gold and silver in 1896 by that received by this Bureau in previous years, and by the estimates and data furnished by such experts in this department of research as Dr. Soetbeer, Professor Lexis, Ottomar Haupt, and others, it is possible to reach an approximate calculation of the minimum amount of gold and silver employed in the arts last year.

First of—

GOLD.

(1) *Austria-Hungary.*—The amount of fine gold used in the industrial arts in Austria in 1896 was 3,763 kilograms, of the value of $2,500,890 No returns of the industrial consumption of gold in Hungary in 1896 have been received, and it is therefore assumed to have been the same as in 1895, viz: 698 kilograms.[1] The total gold thus consumed in the Empire was, therefore, 4,461 kilograms.

Deducting 20 per cent for old material leaves a net industrial consumption of gold in the Empire of 3,569 kilograms, of the value of $2,371,957.

(2) *Belgium and Netherlands.*—Belgium gives no figures of the industrial use of gold in the country in the year 1896, and it is evident that the answer of the Netherlands quoted above furnishes no sufficient basis for an estimate of the industrial consumption of gold in the Netherlands in 1896. In the absence of more definite data, the estimate of that consumption made by Dr. Soetbeer for the Netherlands and Belgium in 1885, viz: Two thousand nine hundred kilograms net, with an addition of 200 kilograms for increase during the last ten years, makes the industrial consumption of the two last-named countries for 1896 3,100 kilograms net.

(3) *England.*—The bureau of the mint has recieved no official information as to the industrial gold consumption of England in 1896, and

[1] Figures published by M. de Foville, "Administration des Monnais et Medailles," p. 183.

recourse is therefore had to an estimate of the same. According to the memorandum by Mr. W. Chandler Roberts-Austen, chemist and assayer, published in the reports of the deputy master of the royal mint, London, for 1893, 1894, 1895, and 1896 the number of ounces of gold wares assayed and marked by the wardens of the assay offices at Birmingham and Chester from 1889 to 1896, inclusive, was as follows:

Year.	Birmingham.	Chester.	Total.
	Ounces, troy.	*Ounces, troy.*	*Ounces, troy.*
1889	158,769	41,883	200,652
1890	193,426	51,166	244,592
1891	230,136	53,715	283,851
1892	228,018	55,789	283,807
1893	229,016	61,318	290,334
1894	223,759	62,442	286,201
1895	239,472	73,283	312,755
1896	283,423	97,281	380,704
Total	1,786,019	496,877	2,282,896

These figures are far from representing the total industrial gold consumption of the United Kingdom, which must, if we are to be guided by earlier estimates, be placed at at least twice these amounts for the years 1889–1896. Professor Lexis estimates it to have been 500,000 ounces, or about 15,500 kilograms net, which figure is here adopted.

(4) *France.*—M. de Foville, director of the mint, Paris, states that the fine weight of the gold employed in the industrial arts in France in 1896 may be estimated at 20,000 kilograms, but that the administration had no data to enable it to answer the interrogatory in regard to the amount of new gold so used during the year. It is highly probable, however, that some part of the 20,000 kilograms of gold reported as used in industry in 1896 was "old material," probably 20 per cent, or one-fifth. This is the percentage of the total consumption of gold in France assumed by Dr. Soetbeer, in his table of the industrial consumption of gold in the world in 1871 to 1880, to have consisted of such material. Twenty per cent of 20,000 kilograms, which would leave the net consumption of gold in France in 1896 for industrial purposes 16,000 kilograms.

Since 1893 there seems to have been a steady increase in the industrial employment of the precious metals in France. M. de Foville has supplied the following data of the gross amount of gold thus used in 1892–1895, as follows (see "Tabellen zur Währungs-Statistik," Sechster Abschnitt, p. 140, Vienna, 1896):

	Kilograms, fine.
1892	17,294
1893	15,595
1894	18,095
1895	19,000

It is worthy of note that the quantities of gold subjected to the guaranty stamp in France is much smaller than that of the total industrial consumption. The quantities from 1883 to 1892 were as follows:

Year.	Imported wares.	Of French manufacture.
	Kilograms.	*Kilograms.*
1883	822	11,949
1884	761	9,990
1885	955	8,435
1886	664	7,736
1887	659	7,505
1888	685	7,411
1889	833	7,762
1890	840	7,598
1891	826	7,501
1892	8,139	

In 1893 there was a total of 8,067 kilograms stamped. The above figures indicate a decrease of articles of French manufacture and an increase of imported articles. In the table of the world's consumption of gold, that of France in 1896 appears at 16,000 kilograms, of the value of $10,633,600.

(5) *Germany.*—Germany's industrial consumption of gold was estimated by Dr. Soetbeer in 1885 at about 12,000 kilograms net. Professor Lexis estimates it at the same figure in 1896. It is probably nearer 13,200 kilograms, at which figure it is placed here.

(6) *Italy.*—In 1885 Dr. Soetbeer estimated the net industrial consumption of gold in Italy at 4,500 kilograms. It is not improbable that it has since increased to 5,000 kilograms net.

(7) *Portugal.*—The employment of gold in the arts in 1895 in Portugal was returned as 1,450 kilograms. Deducting 20 per cent for old material used leaves it 1,160 kilograms net, of the value of $770,936.

(8) *Russia.*—Russia's industrial consumption of gold in 1896 was 5,109 kilograms. Deducting 20 per cent for old material used leaves it 4,087 kilograms, of the value of $2,716,220.

(9) *Sweden.*—The information from Sweden relative to the industrial consumption of gold in 1896 is as follows: "The weight of fine gold which was used in 1896 for the manufacture of gold objects may be estimated at 400 kilograms. The weight of fine gold employed for gilding and other trades is unknown. Of the fine gold employed for the making of gold objects about one-half may be supposed to have been new gold. The rest consisted mostly of gold coin and a small portion of old gold objects." Deducting about 10 per cent for the small part of old gold objects included in the 400 kilograms given above as the total industrial gold consumption of Sweden in 1896 leaves a net industrial employment of gold in that country of 360 kilograms net, of the value

of $239,256. No deduction is made for the gold coin melted down and used, because, as remarked by Dr. Soetbeer:

> It is immaterial for the problem of prices and of standards of value whether newly produced and uncoined gold or gold coin melted down is used for these purposes. The increment to the monetary supply of gold from the annual gold production is only that sum by which the product exceeds the use in the arts, the export to the East, and any loss from accident. We are inclined to agree that half or perhaps more of the gold used in the arts (after deducting the old articles remelted) is obtained by melting coins; but this is of no importance so far as the monetary gold supply and the level of prices are concerned.

(10) *Switzerland.*—Returns for 1894 and 1895 place the value of the gold and silver used for industrial purposes in Switzerland at a total of 40,000,000 francs, the greater part of that sum representing gold. From the Tabellen zur Währungs-Statistik, Sechster Abschnitt, Vienna, 1890, page 134, we learn that 37,000,000 francs of this amount was gold and 3,000,000 francs silver. Assuming 20 per cent of the consumption of gold to have been old material leaves a net industrial gold consumption in 1895 of 29,600,000 francs, or, in round numbers, $5,712,800, representing 8,596 kilograms. The industrial consumption of gold in Switzerland in 1896 is assumed to have been the same as in 1895.

(11) *Other countries.*—The industrial consumption of gold in civilized countries other than the United States and those mentioned above may be reasonably assumed to be 5,000 kilograms. Reducing the above estimate to tabular form, the world's industrial consumption of gold in 1896 may be placed at 89,154 kilograms, of the value of $59,251,640, as follows:

THE WORLD'S INDUSTRIAL CONSUMPTION OF GOLD IN 1896.

Country.	Weight.	Value.
	Kilograms.	
Austria-Hungary	3,569	$2,371,957
Belgium Netherlands	3,100	2,060,260
England	15,500	10,301,300
France	16,000	10,633,600
Germany	13,200	8,772,720
Italy	5,000	3,323,000
Portugal	1,160	770,936
Russia	4,087	2,716,220
Sweden	360	239,256
Switzerland	8,596	5,712,800
United States	13,582	9,026,591
Other countries	5,000	3,323,000
Total	89,154	59,251,640

The above total may be said to represent the estimated minimum consumption of gold in the arts in 1896 in Europe and America. What the consumption of gold in Asia is it is of course impossible to state;

but from what is said above the excess of imports over exports of gold into India, which in the fiscal year ended March 31, 1897, amounted to 22,910,383 rupees, or 309,365 ounces 0.916⅔ fine, might possibly be considered as having been employed industrially and hoarded in the form of ornaments. This represents $5,862,200, or 8,790 kilograms. As, however, it is converted into ornaments, not so much that it may serve any useful purpose as for hoarding, it has not generally been considered as being employed industrially, but as having been definitively exported, and, so to say, "buried"—lost to civilization, at least for the time being, for monetary purposes.

The industrial employment of gold in China, whether large or small, may be neglected, as it does not draw for that purpose on the stock newly produced in other countries or on the estimated production of the world in any given year. What amount is used in Japan is not known, but most likely it is not great. True, some is used in the ornamentation of Japanese articles—lacquer ware—and some in gilding; but when it is considered that an ounce of gold can be beaten out so that it will cover 189 square feet of surface, it becomes plain that a very small amount can be made to go a great way when thus employed. The industrial consumption of gold in Australia and Africa is insignificant.

The annual industrial consumption of newly produced gold is frequently placed at a higher figure than that given above—sometimes at one-half or more of the yearly production—without, however, any numerical demonstration that such is its magnitude. Writing in 1892, Professor Lexis said:

> The industrial consumption of gold exceeds, even after deduction has been made of the old material employed but with inclusion of the melted coins used, one-half the annual production of gold.
>
> Censuses of the industrial production of the precious metals are made from time to time only in the United States, and since 1878 there has been a steady increase of the industrial demand for gold in that country. In 1890 it was estimated at $18,105,910. For most other countries Soetbeer has made estimates of sufficient accuracy. According to these estimates, industry employed, in 1883, 110,000 kilograms of gold, 20,000 of which were obtained from old material. Germany's share in the total consumption was estimated by Soetbeer at 15,000 kilograms.
>
> At present (1892) the industrial gold consumption may be estimated at $71,430,000, i. e., at more than three-fifths of the total annual production. The yearly increase of the world's stock of coined gold is, approximately, equal to the difference between the annual production of gold and the industrial consumption of the metal, for, to the extent that coins are melted down for this purpose, the gold stock must first be restored to its original amount by new coinage, and the coinage of older bars is offset very nearly by the newly produced bars set aside.
>
> Only the coinage from old-gold ware melted down has not here been taken into consideration; but this coinage is not large. According to this, the annual increase of gold ware of all kinds would stand to that of coinage as 3 : 2. If this same proportion should hold good for times past, and the wear and tear of gold ware and gold coins were about the same, the amount of gold in the form of manufactured articles, ornaments, etc., would stand to that in the form of coin and bullion in banks in the same proportion.

The recent withdrawals in England of the coins minted previous to the reign of Victoria shows that the sovereigns had lost 1.8 per cent, and the half-sovereigns 4.9 per cent, and that as the average period during which they were in circulation was 62 years, the yearly abrasion was three ten-thousandths for the sovereigns and about eight ten-thousandths for the half-sovereigns. The 20-franc gold pieces in France and Switzerland have been found to have been abraded two ten-thousandths per annum. As in remoter periods, the pieces of about the size of the half-sovereign, whose abrasion was greatest, preponderated in the circulation, it may be assumed that there was an average abrasion in general of, annually, five ten-thousandths, especially if the still larger loss by melting be taken into the account. In the case of rings, watches, and chains, etc., that are always carried on the person, the loss is still greater than that of coins, but is smaller in the case of other ornaments and articles; and we may, therefore, allow the same coefficient of abrasion for wrought gold. But the greatest loss of gold at present is caused by gilding.

According to the data obtained in the United States, the gold-leaf industry employs about 7½ per cent of the gold industrially used in that country. The use in galvanic and other kinds of gilding may therefore be assumed at at least 10 per cent of the industrial consumption, or, for the entire European continent, at at least 10,743 kilograms, or $7,140,000. This amount of gold must be considered irretrievably lost, since it, sooner or later, totally disappears by friction. It constitutes somewhat more than one one-thousandth of the probable gold stock, in coins and ornaments, of the civilized world at the present time, and this proportion may be allowed to hold for the past also. The other losses of gold, by employment in photography, by shipwreck, buried, etc., amount at present to but few hundreds of thousands of dollars per annum, and are therefore very small as compared with the total stock, whereas in former times the last-mentioned causes of deperdition were more important. The remainder of the gold lost must be taken rather from the monetary stock than from that of wrought gold, but it is not necessary to dwell further on this difference in this place.

In 1896 Professor Lexis estimated the total gold consumption of civilized countries at 205,000,000 marks, or $48,790,000, and commented thereon in his later estimate as follows:

This amount is smaller than the one I, myself, formerly accepted, but it is not probable that it is too high. Rather might it be assumed that the additions made for the uncontrolled gold consumption in France and England is too large. On the other hand, it is probable that the industrial consumption of gold in the United States will increase again in the next succeeding years. But even if we assume an annual industrial consumption of gold in recent years of 220,000,000 marks ($52,300,000), and add to this $7,140,000 for export to India and Eastern Asia, we have, for Europe and America, from $111,860,000 to $114,240,000 remaining to increase their monetary stock, which is amply sufficient for the wants of all countries who, considering their financial situation and their international indebtedness, are able to maintain the gold standard.

What effect the very large increase in the world's output of gold since 1886, and especially since 1893, has had on the industrial employment of the metal it is not possible to determine with the meager data obtainable at present. In France it increased in 1896 about 5¼ per cent over the consumption of 1895, while in the United States it decreased. In other countries the use of newly produced gold in the arts was in 1896 probably greater than the amounts credited them in the table, which, everything considered, must be taken as minimum estimates, the aggregate of which, 88,131 kilograms, is strikingly close

to that made by Dr. Soetbeer in 1891 of 90,000 kilograms. Assuming the total given above to be an approximately correct calculation of the amount of new gold used in civilized countries in the arts in 1896, and adding to it the amount of gold shipped to India from London during 1896, £1,939,915, or $9,440,596, representing 14,205 kilograms, reaches a total of $68,692,236, which, deducted from the total production of the year, viz, $202,956,000, leaves an available amount for monetary purposes, whether in the form of coin or bullion, of $134,263,764.

SILVER.

The information received by this Bureau relative to the industrial use of silver in the several countries, so far as any was furnished by them, is given above.

(1) *Austria-Hungary.*—The quantity of silver industrially employed in Austria in 1896 was 52,326 kilograms, fine. No returns have been received from Hungary, and its industrial consumption of silver in 1896 is assumed to have been the same as in 1895, or 5,282 kilograms,[1] making the total for Austria-Hungary 57,608 kilograms. Deducting 25 per cent for old material employed, gives the Empire a total industrial consumption of silver of 43,206 kilograms.

(2) *Belgium.*—The Bureau of the Mint received no official information as to the industrial consumption of silver in Belgium in 1896, and therefore adopts Professor Lexis's estimate for 1895—viz, 20,000 kilograms—as holding good for 1896.

(3) *England.*—Professor Lexis estimates the net industrial consumption of silver in England in 1895 at 140,000 kilograms, and, in the absence of more reliable data, that estimate is accepted by this Bureau as a close approximation to the actual amount industrially employed in that country. Professor Lexis says:

> In view of the estimate made of the industrial employment of silver in France (141,000 kilograms) and that of the United States in 1894 (232,000 kilograms), the figure assumed by Mr. Ottomar Haupt to represent the net industrial consumption of silver in England in 1890 seems decidedly too low. Nor do the statistics of the consumption of crude silver in England, published by the Frankfurt Metallgesellschaft, based on the imports and exports and the estimated domestic production of silver, inspire much confidence. For 1893 and 1894 the figures are 213,000 and 234,000 kilograms, while for 1891 and 1892 they show an export of crude silver (1,647,000 kilograms and 923,000 kilograms) greater than the sum of the domestic production (600,000 and 926,000 kilograms) and imports of crude silver (974,000 and 926,000 kilograms) by 121,000 and 104,000 kilograms, respectively. But, besides these items, the imported and exported foreign silver coins should have been taken into consideration, since they, too, may be employed as industrial raw material. If these be included, the average annual industrial consumption of silver in England is found to be 206,000 kilograms. For coinage there was used, after deduction of the abraded coins recoined during this period, an annual average of 97,000 kilograms of fine silver, and hence 113,000 kilograms were used annually for other purposes. The prin-

[1] Official figures published by Mr. de Foville, director of the French mint.

cipal bases of this calculation, especially the estimate of the silver obtained from foreign ores, are very uncertain, and when we compare the silver consumption of the United States and France with that of England, we feel disposed to place the industrial employment of silver in the latter country at at least as high a figure as that of France.

Professor Lexis accordingly estimates it at 140,000 kilograms net.

(4) *France.*—M. de Foville estimates the industrial consumption of silver in France in 1896 at 187,000 kilograms. Assuming 25 per cent of this to have been old material, leaves a net industrial consumption of 140,250 kilograms.

(5) *Germany.*—The tables of the Metallgesellschaft give as Germany's average industrial consumption of crude silver in the years 1890–1894 175,000 kilograms, to which must be added 8,500 kilograms, representing the excess of the imports of silver coin over the exports. The silver employed in coinage need not be deducted, as it is obtained exclusively from the melting of thalers. There is therefore a net consumption for Germany for industrial purposes of 183,500 kilograms. Considering the large export of silverware from Germany and the great development of the silvering, silver-plating, and chemical industries of that country, Professor Lexis does not consider this estimate at all incredible; still he hesitates to adopt it, especially as Ottomar Haupt placed Germany's industrial use of silver at only 100,000 kilograms in 1890. Professor Lexis is of opinion that 150,000 kilograms may be assumed without any hesitancy to represent the industrial employment of silver in the Empire in 1895, and the same figures may be adopted for 1896.

(6) *Italy.*—In 1885 Dr. Soetbeer estimated the industrial consumption of silver in Italy to be 19,000 kilograms, since when it may be assumed to have increased at least 10 per cent, making it in 1896 about 21,000 kilograms.

(7) *Netherlands.*—The answer that came to the Bureau of the Mint's interrogatory regarding the industrial consumption of silver in the Netherlands for 1896 furnishes no data sufficient to base an estimate of such consumption on in 1896, and the Bureau adopts that of Professor Lexis, viz, 12,000 kilograms net.

(8) *Portugal.*—According to the returns received from Portugal, 7,340 kilograms of silver were employed in the arts in that country in 1896, one-fifth of which may be assumed to have been old material, leaving a net industrial consumption of 5,872 kilograms.

(9) *Russia.*—Russia's industrial consumption of silver in 1896 was reported to this Bureau to have been 126,336 kilograms, fine, 25 per cent of which may be estimated to have consisted of old material, making the net industrial consumption of silver in that country about 94,852 kilograms.

(10) *Sweden.*—Respecting the industrial consumption of silver in Sweden in 1896, this Bureau was informed that it amounted to 3,355

kilograms. Professor Lexis placed it in 1895 at 3,000 kilograms net, which amount is here adopted.

(11) *Switzerland.*—According to the Austrian Tabellen zur Wahrungs-Statistik, Sechster Abschnitt, Vienna, 1896, page 134, the industrial consumption of silver in Switzerland in 1894 was 3,000,000 francs, or about $600,000, which represents, at the average price of silver in 1895, viz, $21.029 per kilogram, about 28,500 kilograms. Professor Lexis, however, estimates it at 25,000 kilograms net, while it was estimated by Soetbeer for the period 1871–1880 at 24,000 kilograms, and he calculated it at the same figure in 1885. Haupt estimated it in 1892 at 50,000 kilograms. The information received by the Bureau of the Mint is that the total consumption of gold and silver in Switzerland represents a value of 40,000,000 francs, divided between the two metals in the proportion of 37 to 3. It therefore places the net industrial consumption of silver in Switzerland in 1894, 1895, and 1896, at about 28,500 kilograms in round numbers.

(12) *Other countries.*—In 1885 Dr. Soetbeer estimated the industrial consumption of silver in countries other than those mentioned above at 40,000 kilograms. It may be safely assumed that it has since increased at least 10,000 kilograms, and it is therefore estimated in 1896 at a minimum of 50,000 kilograms net.

Adding the figures given above for the various countries, the world's industrial employment of silver in 1896 is found to be 928,301 kilograms, of the coining value of $38,580,184 and the commercial value, at the average price of silver in 1896 of $0.674 per fine ounce, of $20,111,728.

THE WORLD'S INDUSTRIAL CONSUMPTION OF SILVER IN 1896.

Country.	Weight.	Coining value.	Commercial value.
	Kilograms.		
Austria-Hungary	43,206	$1,795,641	$936,062
Belgium	20,000	831,200	433,302
England	140,000	5,818,400	3,033,113
France	140,250	5,828,790	3,038,530
Germany	150,000	6,234,000	3,249,764
Italy	21,000	872,760	454,967
Netherlands	12,000	498,720	259,981
Portugal	5,872	244,040	127,217
Russia	94,852	3,942,049	2,054,979
Sweden	3,000	124,680	64,995
Switzerland	28,500	1,184,460	617,455
United States	219,621	9,127,444	4,758,108
Other countries	50,000	2,078,000	1,083,255
Total	928,301	38,580,184	20,111,728

THE WORLD'S PRODUCTION OF GOLD AND SILVER IN 1896.

The world's production of gold in 1896 was 305,379 kilograms, or 9,817,991 ounces, fine, of the value, in round numbers, of $203,000,000, as compared with 299,885 kilograms, or 9,641,337 ounces, fine, of the value of $199,304,000 in 1895, an increase of $3,696,000.

This increase of the world's gold output in 1896 over that of 1895 is not as great as was that of 1895 over 1894, which amounted to $18,129,000; nor is it as great as the increase of any recent year over the preceding one, as will be seen from the following figures:

Increase of gold product of—

1891 over 1890	$11,801,000
1892 over 1891	16,002,000
1893 over 1892	10,843,000
1894 over 1893	23,681,000
1895 over 1894	18,129,000
1896 over 1895	3,696,000

The reduction in the increase of the world's product in 1896 over 1895 is no evidence that the flood of gold which began to rise shortly after the discoveries on the Witwatersrand district is subsiding. It is due almost entirely to the diminished product in that district in 1896, the causes of which are fully stated in the papers published in this report on the production of the Randt in 1896—causes which have already entirely ceased to operate, and but for which the increase in the world's output of gold in 1896 would certainly have averaged as high as in previous years.

The world's output of silver in 1896 was, approximately, 5,136,274 kilograms, or 165,100,887 ounces, fine, of the commercial value, at the average price during the year of $0.674 per ounce, fine, of $111,278,000, and the coining value of $213,463,700, a decrease as compared with 1895 of 68,000 kilograms, or 2,187,842 ounces, fine, of the commercial value of $1,474,606, and the coining value of $2,828,725.

While there was a decline in the world's silver output in 1896 over that of 1895, there was an increase in it over that of 1894 of about $500,000 coining value, representing 390,493 ounces, fine.

The following table shows what countries increased and what decreased their gold product in 1896 as compared with 1895:

Countries.	Increase in 1896.	Decrease in 1896.	Countries.	Increase in 1896.	Decrease in 1896.
United States	$6,478,000		Venezuela	$39,000	
Australasia	383,600		Guiana (Dutch)		$43,800
Mexico	2,331,700		Peru	52,800	
Russia		$7,358,600	Japan	196,200	
Germany		1,084,000	China		497,000
Austria-Hungary	163,700		Africa		147,300
Sweden	23,600		India (British)	1,474,300	
Great Britain		82,400	Korea	22,600	
Canada	899,300		Total	12,865,000	9,213,100
Colombia	107,200		Net increase	3,651,900	
Bolivia	683,000				
Brazil	10,000				

The countries whose silver product shows an increase or decrease in 1896 as compared with 1895 are as follows:

Countries.	Increase in 1896.	Decrease in 1896.	Countries.	Increase in 1896.	Decrease in 1896.
United States	$4,018,200		Great Britain		$23,000
Australasia	3,429,800		Canada	$1,848,500	
Mexico		$1,701,900	Bolivia		9,050,500
Russia		84,700	Peru		1,175,200
Germany	93,600		Japan	442,800	
Austria-Hungary		414,200	Total	9,832,900	12,661,700
Sweden		26,300	Net decrease		2,828,800
Norway		43,100			
Greece		142,800			

The total world production of gold, from 1871 to the end of 1896, both years included—that is, from the year in which Germany took the first legislative measure toward realizing its long-cherished ideal of going over to the gold standard, to the present—was 4,877,228 kilograms, or 156,803,002 ounces, fine, of the value of $3,241,405,729.

The total world production of gold, from 1493 to 1871—that is, from the discovery of America to the year in which Germany took the first steps toward the demonetization of its silver—was 8,658,175 kilograms, or 278,360,543 ounces, fine, of the value of $5,754,223,105.

From the above figures it therefore appears that the product of the gold mines of the world during the last twenty-six years was 56 per cent, or over one-half of the amount extracted from them in the three hundred and seventy-eight years from 1493 to 1871. Yet, during all the years prior to 1871 there was no cry anywhere of a dearth of gold. During the greater portion of the last quarter of a century that cry has been frequently and loudly heard in many quarters, but especially in the United States, the land that produced more gold than any other. And, strange to say, the cry has grown louder the greater the amount of gold extracted annually from the mines of all countries.

Again, the average annual production of gold in the world, from 1493 to 1871, was 22,900 kilograms, or 736,236 ounces, fine. During the years 1871–1896, which might be designated the "dearth-of-gold" period, it has been 187,585 kilograms, or 6,030,862 ounces, fine—that is, over eight times as much per annum as previous to the so-called demonetization of silver.

The total world's production of gold, from 1493 to 1896, or in four hundred and three years, was 13,535,403 kilograms, or 435,163,545 ounces, fine. As during the last twenty-six years the world's production was 4,887,228 kilograms, or 157,124,502 ounces, fine, it follows that since 1871 the amount of gold put on the markets of the world was over 36 per cent of the total quantity obtained in the four hundred and three years since Columbus landed on the soil of America.

The world's production of gold in the five years 1856–1860, when

the Californian and Australian gold mines were astonishing mankind by an outflow of gold such as had never been seen before, the world's production of the metal was 1,008,750 kilograms, or 32,431,338 ounces, fine. During the five years 1892 to 1896, that production has been 1,335,728 kilograms, or 32 per cent greater.

During the years 1856–1860, the period of the greatest productiveness of the Californian and Australian mines, the total value of the two metals, gold and silver, extracted from the mines of the world, was $858,507,000.

During the five years last past (1892 to 1896, both inclusive), the value of the gold alone extracted from the mines of the world was $887,725,000, or $29,218,000 more than the value of both metals produced when gold came in such streams from the mines of Australia, California, and Russia, that eminent theorists and practical men alike thought that it should be demonetized.

During the year 1873, when the standard silver dollar was dropped from the list of coins to be minted in the United States, the production of both gold and silver in all the countries of the world was $177,320,000.

In 1896 the production of gold alone in all the countries of the world was $203,000,000, or over 114 per cent of the world's product of both metals in 1873.

The yield of the world's mines in 1883 was only $95,392,000. In 1896 it was nearly 214 per cent of what it was thirteen years previous.

Truly, such an afflux of gold was a thing undreamt of in 1873, or any previous year in the world's history. Nor is there any prospect that the sources of gold now so plentiful and so rich will soon grow dry.

There is the Yukon just opening up, which may prove another California.

There is West Australia, whose growth as a gold producer is truly wonderful.

When, about ten years ago, mining engineers reached the conviction that West Australia would assume a place among gold-producing countries and play an important part in the future of that metal, many capitalists were of a different opinion; but now, after scarcely four years of continued labor, in spite of the burning sun and of all sorts of hard privations, despite enormous distances and a pathless country, together with the difficulty of procuring and transporting the necessaries of life and of erecting machinery, the most remarkable results have been reached through the intelligent energy of those engaged in the newly-opened industries of the colony.

In 1886 the output of gold in West Australia was 302 ounces, of the value of £1,148, or $5,586.74—the ounce being valued at £3 16s., or $18.49. Up to the 13th of June, 1897, the astonishing figure of 265,330 ounces, crude, of the value of £1,008,254, or $4,876,668.09, or a total yield up to that date of 1,232,956 ounces, of the value of £4,685,234, or $22,800,691.26.

The following table shows the growth of the gold-mining industry of West Australia during the period of 1886 to 1896 and during the first half of 1897:

Year.	Output.			Value.		
	Ozs.	*dwt.*	*grs.*	£	*s.*	*d.*
1886	302	0	0	1,147	12	0
1887	4,873	0	0	18,517	8	0
1888	3,493	0	0	13,273	8	0
1889	15,492	10	0	58,871	10	0
1890	22,806	6	6	86,663	19	9
1891	30,311	1	9	115,182	1	2
1892	59,548	6	4	226,185	11	5
1893	110,890	18	5	421,385	9	2
1894	207,131	6	6	787,098	19	10
1895	231,512	13	21	879,748	4	8
1896	281,265	6	12	1,068,808	4	8
1897 (six months)	265,329	19	2	1,008,253	16	6
Total	1,232,966	7	17	4,685,234	5	2

The first six months of the year are usually the worst, because of the hot season.

The production of the first half of 1897 is almost equal to that of the entire previous year; and if the progress made during the last half equals that of the first half of 1897 the statistics of the twelve months of this year will represent a value of gold considerably over £2,000,000, or $9,733,000.

"Westralia," says Mr. Burton S. James, a mining engineer of well-earned reputation, "is a country of surprises, of which many are yet in store."

WESTRALIAN GOLD PRODUCTION.

Since the commencement of 1895 the gold exports from the colony have been as follows:

Month.	1897.		1896.		1895.	
	Ounces.		*Ounces.*		*Ounces.*	
January	40,386	£153,469	16,350	£62,130	18,617	£71,009
February	32,526	123,593	17,922	68,104	15,509	58,935
March	40,290	153,126	11,085	42,122	10,619	74,554
April	39,660	150,709	16,773	63,736	19,128	72,687
May	59,111	224,624	22,266	84,611	19,208	72,991
June	53,348	202,724	27,938	106,148	16,129	61,299
July	48,811	185,182	16,258	61,712	20,195	76,743
August	65,129	247,490	29,517	112,164	23,669	79,940
September	71,776	272,750	35,301	134,135	18,245	89,940
October	75,690	287,622	27,331	100,156	27,726	105,357
November	.....	.....	30,874	117,322	15,508	58,930
December	.....	.....	29,635	112,681	17,890	67,092
Total	526,727	2,001,290	281,263	1,061,800	231,513	879,748

It will be seen from this that for the ten months the total exports of the precious metal have been 526,727 ounces crude, valued at £2,001,290, or $9,739,277.79, or not far short of double the amount shipped during the whole of 1896.

Then, again, there is the Transvaal, especially the Witwatersrand district. While the gold product of this district in 1896 was about the same as in 1895, now that the South African Republic has returned to normal conditions, mining operations have resumed their onward and upward course, as is demonstrated by the statement here subjoined showing the monthly yields since January, 1893:

Month.	1893.	1894.	1895.	1896.	1897.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*	*Ounces.*
January	108,374	149,814	177,463	148,178	209,832
February	93,252	151,870	169,295	167,018	211,000
March	111,474	165,372	184,945	173,952	232,067
April	112,053	168,745	186,323	176,707	235,698
May	116,911	169,773	194,580	195,008	248,305
June	122,907	168,162	200,941	193,640	251,529
July	126,169	167,953	199,453	203,873	242,479
August	136,069	174,977	203,573	213,418	259,603
September	129,585	176,707	194,764	202,561	262,150
October	136,682	173,378	192,652	199,889	274,175
November	138,640	175,304	195,218	201,143	.....
December	146,357	182,104	178,428	206,517	.....
Total	1,478,473	2,024,159	2,277,635	2,281,874	2,426,838

It may be safely calculated that the production of the Witwatersrand in 1897 will closely approximate to 3,000,000 ounces crude, and may possibly exceed that figure. This would make the production of the Randt alone in 1897, $52,500,000. Adding 300,000 ounces for the rest of the Transvaal would give that Republic in 1897 a total production of $57,750,000, making it, possibly, the chief gold producer of the world.

While the total gold yield of South Africa in 1896 was, for reasons explained elsewhere in this report, $147,300 less than in 1895, the product of 1897 will exceed that of 1895 by nearly $14,000,000.

But West Australia and South Africa are not the only countries where the gold product promises an increase in the future. Judging from the statistics of the gold output of the principal gold-yielding countries in the past, it may safely be predicted that the extraction of gold from the mines will for years to come be an increasing one.

It has, on the whole, been an increasing one since 1886. Simultaneously with the discovery of the Witwatersrand gold fields, in that year, the gold mines of all countries seemed to have gained new life.

The discovery of the Randt fields, in 1886, marks an epoch—the last of four—in the production of gold, just as much as the discoveries of that metal in California and Australia, in 1848 and 1851, marks another;

the third ended in 1885. The first period extended from the earliest times to 1492, and the second from 1492 to the Australian and Californian discoveries. The fourth properly begins in 1886, the year in which the Randt mines were discovered, and not in 1887, in which year the Transvaal began to figure to some small extent in the list of gold-producing countries, for their discovery was of far greater importance to the world than the few thousand ounces of gold which they added to the supply of that metal in the latter year.

It can not be disputed that the discovery of the Witwatersrand mines marks an epoch in the history of the production of gold, and is entitled to a place side by side with the discovery of the mines of California and Australia, which has always been considered by statisticians a point of demarcation between two periods in the history of the production of the precious metals.

On the first two of the periods into which the history of the production of gold has been divided above it is not necessary to dwell here. The third might also be passed over in silence were it not necessary to compare it with the fourth in order to form an intelligent opinion on the relative magnitude of the output of gold in recent years, on its prospective production in years to come, and to bring out into strong relief the fact that never before in the life of mankind has the yearly supply of that metal been as great as now. To effect this purpose it is necessary to go back a few decades before the beginning of the third period.

The average yearly production of gold during the ten years 1831–1840, was only 20,289 kilograms, or 652,291 fine ounces; during the ten years 1841–1850 it rose to an annual average of 54,759 kilograms, or 1,760,502 ounces. This was just prior, it will be noticed, to the beginning of the third period into which the history of the production of gold has been divided. Now, mark the increase. During the five years 1851–1855, in consequence of the rich harvest from the recently discovered mines of California and Australia, the average annual production of gold suddenly leaped to 199,388 kilograms, or 6,410,324 ounces, and in 1856–1860 to the highest figure that had ever been reached up to that time, and which has never been exceeded since except in 1892, 1893, 1894, 1895, and 1896, namely, to 201,750 kilograms, or 6,486,262 ounces; that is, in between twenty and twenty-five years the annual average of the production of gold increased nearly tenfold. Even the production of silver during the last quarter of a century has not increased at that rate—1,000 per cent. After 1860 the average steadily declined, except during the five years 1866–1870, until in 1881–1885 it fell to 149,137 kilograms, or 4,794,755 ounces.

Thus the decrease in the annual average production of gold after 1860 had been continuous for almost a quarter of a century, and there were not wanting prophets of evil, among them men of world-wide renown in science, like the eminent Austrian geologist Dr. Suess, who proph-

esied that the decline would be permanent. Suess's book, The Future of Gold, published in 1877, created a sensation in the politico-economic world, although the point from which he viewed his subject was strictly that of a geologist, and not of an economist. His celebrated theory is contained in the fourth and fourteenth chapters of his book. Briefly stated it is this: The earth was, myriads of ages ago, in a molten or fluid state. When in that condition, the heavier elements of which it is composed sank, in obedience to the law of gravitation, deepest, and now lie nearest to the earth's center. But the precious metals are among the heaviest of all metals—gold, with a specific gravity of 19.253 ranking third, immediately after iridium and platinum. Much lower in specific gravity are silver (10.74), copper (8.09), iron (7.54), etc., but all with a much higher specific gravity than the earth as a whole. Gold is therefore one of the metals farthest removed from the earth's surface and most inaccessible to man, "because at a comparatively small distance from it the increasing temperature reaches so high a degree that mining there finds its limit." After an exhaustive review of all the gold fields of the world and of their condition at the time he wrote Suess reached the following conclusions:

(1) That the production of gold in the future would have to depend mainly on the outpnt from alluvial deposits.

(2) That geographical discovery and the new or increased production of gold went hand in hand.

(3) That much more than one-half of the quantity of gold obtainable by the means hitherto employed passed through the hands of man.

(4) That the exhaustion of the alluvial deposits and the decline of the production of gold to a small fraction of what it had hitherto been were facts that could already be foreseen.

(5) That the time would certainly come, and probably after a few centuries, when the production of gold would cease to an extraordinary extent, and that metal, on account of its ever-increasing scarcity, cease to be able to maintain the economic position it had hitherto held.

(6) That the manner of the occurrence of gold in nature was, therefore, unfavorable to the adoption of the gold standard, and that such a plan, in the light of past experience of the production of gold, could not be approved.

(7) That it had been proven that vein mining, as a rule, showed a decrease in gold contents with the depth.

What of Suess's conclusions? Scarcely one of them has been verified by the experience of the last seventeen years. Production now depends much more upon vein mining than on gold washings. Fully 70 per cent of the world's production of gold is obtained from the solid rock. There has been increased production, independent of geographical discovery, by improved technic processes, especially by the cyanide process. Gold production is not declining, but advancing, and in South Africa it has been demonstrated that the gold contents increase with the depth.

If Suess's book had been published in 1857, instead of twenty years later, the world would have ridiculed his theory, notwithstanding the learning, ability, and acumen of its author. But it appeared at a time when the production of gold had been and still was on the decline, and when men's minds were prepared to believe that the decline would be permanent and irretrievable.

That it has not been so is amply demonstrated by the yield of gold during the fourth period of the history of its production, as will be seen from the figures given below, in which the output of the yellow metal in 1886–1896 is given, in fine ounces and values:

Years.	Ounces fine.	Value.	Years.	Ounces fine.	Value.
1886	5,135,679	$106,163,900	1892	7,094,266	$146,651,500
1887	5,116,861	105,774,900	1893	7,618,811	157,494,800
1888	5,330,775	110,196,900	1894	8,764,372	181,175,600
1889	5,973,790	123,489,200	1895	9,641,337	199,304,100
1890	5,749,306	118,848,700	1896	9,817,991	202,956,000
1891	6,320,194	130,650,000			

The first rude shock which Suess's theory received was the discovery of the Witwatersrand gold field in the South African Republic, which marks the beginning of the fourth and last period into which the production of gold has been divided by the writer. Here was something new, which had not been dreamt of in Suess's philosophy.

The mines of the Witwatersrand did not share at all in the world's gold output of 1886. In 1887 they shared in it only to the extent of 23,125 ounces. Since then their production, as has been seen above, has been phenomenal.

The increase in recent years in the world's production of gold is due most largely to these South African mines. Will that increase continue, and how long? The answer to this question involves a consideration of the prospects of production in South Africa. It was remarked above that here was something Professor Suess had not dreamt of in his philosophy. The Witwatersrand mines had not been discovered when he wrote his book. Not only that, but the occurrence of gold under the geological conditions in which it is found in the Witwatersrand had been considered impossible until it was actually obtained there. Geologists were acquainted in 1877 with only two forms of the existence of gold in nature, in veins and as alluvial deposits. In the Witwatersrand it is found in sedimentary rock, in strata the component parts of which are pieces of quartz held together by a clayey cement.[1]

The Witwatersrand produces by far the greater part of the total gold output of South Africa—indeed of all Africa.

In 1893 the German Government sent a mining expert, Herr Schmeis-

[1] A somewhat similar formation of very limited extent had, it is said, been previously discovered in France.

ser, to investigate and report upon the gold mines of the Transvaal. In his report he expresses the opinion that a calculation of the total amount of gold in the Witwatersrand is impossible, and that in making an estimate of it it is necessary for the present to limit one's investigation to a well-defined and adequately explored tract of the district and endeavor to establish the lowest figures for that section. For that purpose he chose the part of the gold field lying between the eastern limit of what is known as the Langlaagte B gold mine and the western limit of the Glencairn mine, which has a profitable length, he stated, of about 11½ miles.

It is not necessary, nor is there space, to give here the data he employed. It is sufficient to say that he calculated that from this tract 63,548,000 ounces of gold could be obtained. As, however, nearly two-thirds of the total yield of the Witwatersrand, from 1888 to January 1, 1894, had come from mines in that tract, the above figures had to be reduced to 59,572,149.6 ounces, of the value of $1,020,828,355, which still remained to be mined. At the average rate of increase of the gold product of the Witwatersrand, he estimated that the exhaustion of the lodes on this tract would occur about the year 1919. This calculation was made on the assumption that a depth of 800 meters, or 2,625 feet, had been reached. If mining could be carried on at a depth of 1,200 meters, or 3,937 feet, the supply of gold from this tract he calculated, would aggregate 99,821,892 ounces, of the value of $1,710,506,000, and that at the same rate of increase it would require forty years to mine that quantity. Mr. Hamilton Smith, a distinguished American mining engineer, in 1892 estimated the amount of gold in this same tract to a depth of 3,000 feet at $1,044,900,000. Herr Schmeisser ascribes the large result reached by himself partly to a slight difference in the length of tract investigated and partly to the fact that a deep boring made in 1893 in one of its mines warranted him to assume a less rapid dip of the lodes at lower depths. It must be remembered that while the tract under consideration above has a length of only about 11½ miles the Witwatersrand has a length of 50 miles. The conclusions of Herr Schmeisser and Hamilton Smith have been fully confirmed by the investigations of Mr. George F. Becker, of Washington, D. C.

It would be an easy matter to cite a host of other experts whose evidence is corroborative of that just quoted. All competent judges agree that the output of the Witwatersrand mine is assured for a considerable period of time. The pyrites occurring at a certain depth which could not be treated by amalgamation have yielded up their gold contents to chlorination, and it has become possible, by the introduction of cyanide process, to obtain almost the last traces of gold from the "tailings," which had hitherto been considered worthless. At present only 5 per cent of the gold is lost.

The gold obtained in the Witwatersrand from tailings by the cyanide process was: In 1892, 160,169 ounces; in 1893, 304,498 ounces; in 1894,

694,625 ounces; in 1895, 749,325 ounces; and in 1896, 770,548 ounces crude.

In the United States the production of gold since 1886 has been as follows:

Year.	Ounces fine.	Value.	Year.	Ounces fine.	Value.
1886	1,693,125	$35,000,000	1892	1,596,375	$33,000,000
1887	1,596,375	33,000,000	1893	1,739,326	35,955,000
1888	1,604,841	33,175,000	1894	1,910,813	39,500,000
1889	1,578,000	32,800,000	1895	2,254,760	46,610,000
1890	1,588,880	32,845,000	1896	2,568,132	53,088,000
1891	1,604,840	33,175,000			

The tendency of nearly all the gold-producing States is to add to their annual product. The repeal of the purchasing clause of the act of July 14, 1890, has stimulated the search for gold, and a good share of the increased gold output of the country since 1894 is traceable to it.

There are no indications whatever of a falling off in the future of the productiveness of the gold mines of this country, although, considering the rapid growth of the South African production of gold, it is difficult to predict how long the United States will maintain its supremacy as a gold producer. New mines will, of course, be discovered here, but the discovery of such mines is still more likely in Africa. Much will depend on their relative richness. So far as can now be seen, the greatest hope of a largely increased gold product of the United States in the future lies in the removal of all restrictions on hydraulic mining in California. That has already been done to some extent by the Caminetti act, passed March 3, 1893. If means could be found equitably to remove all restrictions on this class of mining—and that may be a possible achievement—it has been estimated that the deposits in that State would add something like $500,000,000 to the gold stock of the world.

The production of gold in Australia from 1886 to 1896 was as follows:

Years.	Ounces fine.	Value.	Years.	Ounces fine.	Value.
1886	1,278,309	$26,425,000	1892	1,652,442	$34,159,000
1887	1,321,973	27,327,600	1893	1,726,436	35,688,600
1888	1,381,622	28,560,660	1894	2,020,179	41,760,800
1889	1,600,569	33,086,700	1895	2,167,118	44,798,300
1890	1,441,962	29,808,000	1896	2,185,676	45,181,900
1891	1,514,099	31,399,000			

The product from alluvial deposits is continually decreasing in Australia, and that from quartz mining increasing. The alluvial deposits yield only about one-third of the total product of Victoria and not 5 per cent of that of Queensland. On the other hand "the deep leads," which are only deep alluvial beds, but which must be worked like veins,

are far from being exhausted. Thus far they have been operated only to a very limited extent. Moreover, a large number of quartz mines have heretofore been abandoned as soon as the pyrites was reached. There is no reason why work on such mines should not be resumed, with the aid of the newly discovered processes which have proved so successful in South Africa, and with equally successful results. Everything considered, it is to be expected that the production of Australasia will continue to increase at about the present rate, at least, for an indefinite period. There is even a possibility that it may increase largely after some years, and the realization of that possibility depends on how the newly discovered gold fields in western Australia turn out.

Russia next claims our attention. Here, too, where the gold yield is almost exclusively from alluvial deposits, the production of that metal has been almost continuously increasing since 1886, as witness the following figures:

Year.	Ounces, fine.	Value.	Year.	Ounces, fine.	Value.
1886	992,558	$20,518,000	1892	1,200,000	24,806,200
1887	971,951	20,092,000	1893	1,345,222	27,808,200
1888	1,030,484	21,302,000	1894	1,167,450	24,133,400
1889	1,156,433	23,905,600	1895	1,397,767	28,894,400
1890	1,134,781	23,458,000	1896	1,041,794	21,535,800
1891	1,168,861	24,162,500			

The continuity of the progression is broken only in a few years. It is impossible, however, to venture any prediction as to Russia's output of gold in the future. The circumstances on which it depends are too many—legislation, the price of bread, and the seasons. Reasoning from analogy, however, one would be inclined to believe that the production of gold in the great Empire of Eastern Europe would continue to increase for years to come, especially after the trans-Siberian railway, now in process of construction, shall have been completed.

Again, there is India. Outside of the great producing countries—the United States, Australasia, Russia, and South Africa—the increase of the production of gold has nowhere been more rapid. The production of gold in India from 1885 to 1896 was as follows:

Year.	Ounces, fine.	Value.	Year.	Ounces, fine.	Value.
1885	6,531	$135,000	1891	120,696	2,495,000
1886	20,395	421,600	1892	160,523	3,318,300
1887	15,480	320,000	1893	184,468	3,813,600
1888	32,728	676,563	1894	187,835	3,882,900
1889	72,688	1,502,600	1895	225,244	4,656,200
1890	96,750	2,000,000	1896	296,563	6,130,500

The remaining countries to which I shall direct attention of the reader during the years of the last period of the history of the pro-

duction of gold, are the three Guianas. Their gold yield was as follows:

Year.	Ounces fine.	Value.	Year.	Ounces fine.	Value.
1887	34,777	$718,902	1892	198,865	4,110,900
1888	30,141	623,070	1893	215,153	4,447,600
1889	75,479	1,560,300	1894	269,260	5,566,100
1890	102,420	2,117,200	1895	222,748	4,604,600
1891	161,582	3,340,200	1896	220,629	4,560,800

French Guiana not included in 1887 and 1888.

The little table here appended will enable the reader to take in at a glance what the countries named in it have done toward preventing a scarcity of gold and hindering its appreciation during the fourth period in the history of the production of that metal:

Year.	United States.	Australia.	Russia.	Africa.	India.	The Guianas.	Total.
1886	$35,000,000	$26,425,000	$20,518,000	$1,438,000	$421,600	.....	$83,802,600
1887	33,000,000	27,327,600	20,092,000	1,919,600	320,000	$718,902	83,378,102
1888	38,175,000	28,560,660	21,302,000	4,500,000	676,600	623,070	93,837,330
1889	32,800,000	33,086,700	23,905,600	8,586,600	1,502,600	1,560,300	101,441,800
1890	32,845,000	29,808,000	23,458,000	10,256,100	2,000,000	2,117,200	100,484,300
1891	33,175,000	31,399,000	24,162,500	15,742,400	2,495,000	3,340,200	110,314,100
1892	33,000,000	34,159,000	24,806,200	24,232,000	3,318,300	4,110,900	123,626,400
1893	35,955,000	35,683,600	27,808,200	28,943,500	3,813,600	4,447,600	136,656,500
1894	39,500,000	41,760,800	24,133,400	40,271,000	3,882,900	5,566,100	155,114,200
1895	46,610,000	44,798,300	28,894,400	44,554,900	4,656,200	4,604,600	174,118,400
1896	53,088,000	45,181,900	21,535,800	44,407,600	6,130,500	4,560,800	174,904,600

The production of gold was never so rapid as it is to-day. When the yield of Californian and Australian gold mines was at its highest, 1856–1860, Michael Chevalier and other economists began to inquire what measures governments should take to prevent the depreciation of the yellow metal, and some even proposed its demonetization. Yet now, when the production of even 1856–1860 is exceeded, and when the value of the annual product of gold alone is greater than that of the product of both precious metals before the depreciation of silver began, all the economic evils from which the commercial, agricultural, and industrial world is suffering are ascribed to the scarcity of gold! What better refutation can there be of such a fallacy than the figures adduced in the foregoing pages? They are more convincing than words, for if there is a scarcity of gold now, when was there enough of it?

Enough of it to satisfy human covetousness or to slake mankind's "accursed thirst for gold" there never will be. But that is not the question. Nor is the question either whether there is enough gold to enable all nations to adopt the gold standard pure and simple, to the exclusion of the metal so long allied with gold as a sister monetary metal of full legal-tender power. The question rather is this: Is there

enough gold at present in existence and likely to come into existence in the near future to enable countries like England, with only gold as a full legal-tender metal, and countries like France and the United States, with the limping double standard—that is, with a large amount of both gold coins and full legal-tender silver pieces overvalued in the coinage—to maintain a relatively safe and sound metallic currency? In view of the facts above set forth it seems unnecessary to demonstrate that there is; and no attempt at such a demonstration will be made here beyond a reiteration of those facts, and referring the reader to what is said in the second half of this paper under the head of "Silver."

It is noteworthy that the newly opened sources of gold production yield mostly quartz gold. The term quartz gold is here used to designate all gold not obtained from washings. The question whether conglomerate beds of the Witwatersrand were originally a sedimentary formation does not practically come into consideration in the making of this distinction, for these beds are mined in the same way as real quartz lodes. Considering the conditions of gold mining in this new region, Lexis thinks it not strange that the influence of the gold production of the Transvaal on the world's business is not nearly as great as was the exploitation of the Californian and Australian alluvial gold beds. He says: "Shortly after the latter mines were discovered several hundred thousand men rushed to these uninhabited countries; many of them were able to enrich themselves by their labor in the gold fields, which were accessible to all; still greater was the number who found it profitable to work in the rapidly growing towns, both in Australia and California, either as workmen or in trade. Important new markets were opened to European commodities, and the shipment of the new gold to Europe was, therefore, followed by an active stimulation of production in many branches of trade and manufacture.

"In the Transvaal, on the other hand, the production of gold is carried on mainly by large capitalists; the work is, for the most part, done by natives, and their wages are relatively low; the profits of the mining industries there, go, for the most part, to Europe, where they constitute for their shareholders, who have bought their securities, as a rule, at high prices, only a small or moderate remuneration for the capital they have invested. The new gold obtained in the Transvaal has, thus far, not been able to exercise any influence on economic conditions, being simply accumulated idly in the great banks of Europe, crowding their vaults in a manner previously unheard of. The Bank of England, since 1893, has had, uninterruptedly, a large overcovering of its notes. At the beginning of 1895 its stock of specie amounted to £33,100,000, and its note circulation to only £25,900,000. On the 25th of November the former had risen to £43,700,000, while the latter remained at the figure already quoted, so that the Bank of England had a gold overcovering of its notes of about £17,800,000, but the increase of its stock of specie exceeded by 40,000,000 of marks ($9,520,000) the total production of the

Transvaal during the period in question. It is also noteworthy that the sum of the total deposits, estimated by the London Economist in June, 1895, to be in the British banks, and which must be looked upon as the expression of the capital available for British business, and which amounted to from six to seven times as much as the specie stock of the country, was represented by higher figures than ever before; that is (inclusive of the deposits of the Bank of England), by £730,000,000 to £740,000,000. .

"The crisis in mining stocks, with its reflex action, produced in October and November of 1895 a certain money stringency in most stock exchanges, and as a consequence the specie stock of the three large central banks of Europe decreased to some extent. But, notwithstanding, the gold stock of the Bank of England continued at over £40,000,000, and the overcovering of notes continued to increase, that of the Bank of France by over 1,900,000,000 of francs, and that of the German Imperial Bank over 600,000,000 marks. Despite this critical episode caused by wild speculation, we are still warranted in stating that there is still, as there was previously, an enormous excess of gold in Europe."

Having treated above of the gold yield of the world during the last period of its production, we shall allow the distinguished Director of the French mint, Mr. A. de Foville, to speak of the other three—that is, from the earliest times to the end of 1885. In an article entitled "The geography of gold," published in the Annales de Géographie of May 15, 1897, he says:

"There exists, perhaps, a great deal of gold in the deep layers of the terrestrial sphere. Gold is 20 times as heavy as water, or nearly so, and its very density contributes to hold it nearer the center of the globe. At the surface it is found only in the sporadic and almost molecular state. Imagine a cube measuring 33 feet in length, breadth, and thickness. Such a cube contains no very large volume, and the capacity of a small ship is equal to it. Now, all the gold extracted from the earth from the very beginning would represent a volume no larger than this, and the greater part of this gold is of recent origin. Is it not extraordinary that so small a quantity of the yellow metal has been able to exercise so formidable an influence on the destinies of so many generations?

"What bloody wars, what brutal invasions, what cruel tyrannies, what treachery, and what crimes have had their real incentive in 'auri sacra fames'—the accursed thirst for gold! On the other hand, what an impetus has been given to material progress and to civilization wherever gold has been discovered, whether in America, Australia, or Africa! It will never be known whether gold has been productive of more evil or good to mankind.

"The question we have here to treat is more simple. What we wish is to find and to tell where the gold of former times came from, where it comes from now, and how its *sui-generis* production varied.

ANCIENT TIMES.

"Men do not seem to have immediately turned their thoughts to the auriferous beds that nature placed at their disposal; but, as a matter of fact, the exploitation of gold had begun even before man himself appeared on the earth. The first gold movers, if we may be allowed the use of such an expression, were the torrents—the impetuous streams which, solitarily rushing over the still uninhabited earth, began bravely to demolish the mountains and to transport their pulverized débris into the deep ravines which were thus destined sooner or later to be converted into continuous and fertile valleys. When the rocks disintegrated by the action of the water contained gold dust, that dust was necessarily found in the beds of the rivers and in the alluvions along their banks. This dust is sometimes really imperceptible, and evades all search; sometimes, however, the grains attain a size sufficient to warrant their being ranked as nuggets. Then the windfall is to him who reaches out his hand to possess himself of it.

"Gold, being thus presented in a metallic state, could not fail to awaken the covetuousness of man. It is easily separated from the coarser substances which surround it; mixed with the sand, its superior density enables it to be more easily isolated; incrusted in the rock, fire masters it without any great effort. And thus it happens that long before mercury, and especially the cyanide of potassium, was used in its extraction, our ancestors were able to get possession of gold wherever it was visible to the naked eye.

"And gold, indeed, played a part in history from the most remote period. The golden calf of the Hebrews would alone prove that the contemporaries of Moses worshiped the precious metal and were acquainted with the art of molding it. Even in its monetary form the employment of gold in India, Egypt, and in other countries goes back more than a thousand years before the Christian era, and perhaps two thousand years. We know that under the most various aspects gold shone in the temples and palaces of the Greeks and Romans. These were the receptacles of much that was beautiful, and the remains of these treasures are still found in our museums.

"Care, however, must be taken to guard against exaggeration. Some modern authors have allowed themselves to be dazzled by all that the ancients have said about gold in their histories and descriptions. Both in prose and verse gold produces a good effect, and costs nothing. There is, besides, a species of literary megalomania which is confined to no country and to no time, and it has always affected southern minds more easily than it has others. We must beware lest we become the dupes of this intellectual mirage. Even in our day a distinguished numismatist contends that the amount of gold in circulation in the ancient world was greater than it is at present, and in support of his contention he confines himself to sketching the retrospective inventory of the articles of jewelry mentioned in Homer, Herodotus, in Plutarch

or Polybius, in Lampridius or Xiphilin. One positive document would be worth more than so many equivocal citations. By reasoning as this numismatist—M. Babelon—has reasoned, one might show that the booty of the conquistadores of the sixteenth century in Mexico and Peru amounted to thousands of millions, for the books of the chroniclers make these countries abound in gold with marvelous prodigality. But Humboldt was able to show that this booty did not amount to more than $20,000,000 as a maximum.

"The Russian writer, Mr. Tarrassenko-Otreschkoff, assures us that Asia, before the Christian era, had $333,000,000 in gold and $2,666,000,000 in silver, a total of about $4,000,000,000. How did he reach this conclusion? He admits that Alexander the Great had taken from the nations he conquered by his arms $390,121,600 of gold and silver, and supposes that the whole of Asia must have possessed ten times as much. Statistics thus understood is truly an easy matter. According to the same writer, Africa at this period had $112,000,000 in gold and $56,000,000 in silver, a total of $168,000,000; and Europe $53,200,000 in gold and $106,800,000 in silver, a total of $160,000,000.

"It is of more interest to consult the witnesses of antiquity on the production of gold and silver and on the stocks of those metals; but here again exaggeration is the rule, and even the figures which seem themselves to be the most accurate here must be accepted with the greatest caution. Full credence is not to be given to Strabo when he informs us that in what constitutes the France of to-day the Tarbelli had only to thrust their hands into the sand and draw them back filled with gold; and this all the more as these magic sands were very near the waters of the Garonne.

"In the neighborhood of Aquileia, on the Adriatic, it was claimed that at a depth of 2 feet such a magnificent collection of nuggets had been found that gold had lost in Rome one-third of its value. As two islands in the estuary of the Indus bore the significant names of Chrysos and Argyros, Pliny asked whether it was indeed true that the soil of the former consisted, as it was claimed, entirely of gold and that of the latter of silver. Megasthenes knew that among the Dardæ, between the Indus and the sources of the Oxus, ants as large as foxes carried the gold dust to to the surface, and hence it is easy to understand why Alexander commissioned one of his engineers to go and study on the spot a method so unusual of working the mines. It was otherwise in the country of the Issedones and Arimaspes of Sythia, whose mines were guarded by ferocious griffins. We are here in the region of fable, where no one can be misled, but why should one be more credulous when told that the gold which Philip of Macedon extracted annually from Mount Bermion, in Thrace, weighed a thousand talents, or about 30,000 kilograms, equivalent to about $20,000,000. Even with the perfect processes of modern industry no gold mine has ever yielded such wealth in twelve months. In our day too, a great many foolish things are written about the precious metals, but there is a way to rectify

them. But when antiquity speaks there is no means of verifying its data, and skepticism becomes a duty.

"The gold mines of antiquity constitute a disconnected chain from the Caspian Sea to the columns of Hercules. It was in the massive mountains of the Caucasus and of Asia Minor that the white race found its first El Dorados. The famous Golden Fleece, conquered by Jason, was hidden in the depths of Colchis, and, if it be true that the gold washers of the Phasis thus early employed the skins of sheep to arrest in its passage the gold dust suspended in the waters of that river, it would be easy to reconcile mythology with reality. The whole of Asia Minor was considered rich in the precious metals, and especially Phrygia and Lydia. The Poctolus rolled its golden sands, no doubt, long before Midas the King bathed in it. And all the waters which flow from the Sipylus and Tmolus were equally rich in gold. Nearer to Europe, in Abydos and Cyzicus, gold was also worked. The Phœnicians went in search of it to the island of Thasos, whose metallic deposits were only a continuation of those of Thrace and Macedonia. Philippi, founded in 356 by the father of Alexander, was mainly a mining center, and, without taking seriously the fabulous outputs attributed to it, we must admit that a great deal of gold may have been extracted from the environing mountains. Other mines rose step by step around the upper Danube, in Hungary, Panonia, and Dalmatia. Next comes the region of the Alps, in which were found the gold beds of Acquileia on the Adriatic; those of Vercellæ, between Turin and Milan; those of the country of the Sallassi (the valley of Aosta, etc.). Even in our day a little gold is found in Switzerland, in the Valais, and the rare nuggets which are gathered there enable the mint at Berne to stamp on domestic metal the effigy of Helvetia.

"The Rhine in Germany; the Tessin and the Orco in Italy; in France the Rhone, the Gardon, the Ariege, the Garonne, and the Adour have been the Pactoluses of these countries, and still supply small quantities of gold momentarily after heavy rains; only the gold washers of past centuries considered themselves rich if, at the end of the year, they had accumulated with their pans a pound of gold, a quantity which, considering the high price of commodities at present, would be scarcely sufficient to keep one from dying of hunger.

"Spain, especially Andalusia, the two Bretagnes—the greater and the smaller—Sardinia, and Numidia, also produced gold. And, not content with exploiting all the resources of their immense empire, the Romans attracted to themselves a part of the gold obtained in the most distant regions. Gold came to them from Upper Egypt, where the mines of Etbay, near Kouban, as high up as the Second Cataract, had been the fortune of the Pharaos and Ptolemies. Gold came also as it comes today from Ethiopia. Some also from Arabia, and some from Carmania, from India and from Central Asia, by the way of the Red Sea. It is possible also that some came from the Ural.

THE MIDDLE AGES.

"The Middle Ages were in Europe the real period of the cessation of the production of gold and silver. One of the historians of the precious metals (Mr. W. Jacob) rightly says that the seekers of gold and silver then found it easier to pillage and ransom those who had them than to labor painfully to extract them from the earth. These times of trouble and of violence had not killed the jeweler's art, but they had reduced the art of metallurgy to its simplest expression. From the sixth to the tenth century, inclusive, the Western World certainly lost more gold and more silver than it had obtained, and the efforts of succeeding centuries were also very fruitless in results. Instead of the armies of slaves which the Romans condemned to the hard work of the mines, we now only meet with rare squads of serfs occupied in collecting here and there a little gold and a little silver. The auriferous sands of the Tagus, of the Guadalquivir, and of the Douro, in the Iberian Peninsula, and those of the Rhine on the Strassburg side, did not probably cease to be placed under contribution. There were, besides, in central Europe, Hungary, Transylvania, and elsewhere old Roman workings which were reopened. But little was extracted from them, and industries so precarious produced less gold in a hundred years than was destroyed in ten years of war. There is every reason to believe that from one end of Europe to the other the ten centuries preceding the discovery of America did not produce 10 cubic meters of fine gold. That is less than a cubic meter per century.

MODERN TIMES (1492 TO 1800).

"In 1492 Christopher Columbus discovered the New World. In 1519 Hernando Cortez entered Mexico. In 1527 Pizarro landed in Peru, and in 1533 he became master of the powerful empire of the Incas. In 1535 Charles the V suspended the working of the old mines of Spain and compelled the miners to embark for Mexico and Peru. The conquistadores were first content with laying violent hands on the treasures of the vanquished. They afterwards endeavored to forestall the mineral wealth of the New World. Spain would have desired to maintain the monopoly of its gold and silver mines for all eternity. But, after the peace of Cateau-Cambresis (1559), France and all Europe began to feel the effects of this afflux of silver and gold, the anterior dearth of which doubled its importance. The scarcity of specie in the fifteenth century had become manifest in the growing decline of prices. From the moment that America appeared upon the scene with its precious metals their purchasing power diminished and the level of prices rose rapidly.[1]

[1] We may judge of the intensity of this phenomenon from the following table, in which we have placed in juxtaposition the estimates of specialists, unequally supplied with documentary information. Mr. C. Leber published in French his Essay on the Appreciation of Private Fortunes in the Middle Ages in 1847; the Abbé Hanauer his Economic Studies on Ancient and Modern Alsace in 1878, while G. D'Avenel's History of Prices was published in 1895.

VARIATIONS OF THE POWER OF THE MONETARY METALS IN FRANCE FROM THE FOURTEENTH TO THE NINETEENTH CENTURY.

Century.	Quarter.	According to—		
		C. Leber.	A. Hanauer.	G. D'Avenel.
Fourteenth	First	6	(?)	3½
	Second	6	(?)	3½
	Third	6	3½	3
	Fourth	6	4	4
Fifteenth	First	6	4	4¼
	Second	6	4	4½
	Third	6	4½	6
	Fourth	6	4¾	6
Sixteenth	First	6	5	5
	Second	4	3½	4
	Third	3	2½	3
	Fourth	2	2	2½
Seventeenth	First	2	2	3
	Second	2	1¼	2½
	Third	2	2	3
	Fourth	2	1½	2⅓
Eighteenth	First	2	2	2¾
	Second	2	2	3
	Third	2	2	2⅓
	Fourth	2	1½	2
1800–1850		1	1	2
1880–1890		1	1	1

"What, then, were the imports into Europe of gold and silver which produced this revolution? They amounted to little at first. Beginning with the sixteenth century, the production of the precious metals in the Western World may be followed pretty closely and the statistics of them are, on the whole, among the least contestible of retrospective estimates, especially in what concerns the mines of the New World. The very cupidity of governments made them extremely vigilant in this matter. The cargoes of bars shipped to Europe by their trans-Atlantic possessions were subjected to the very strictest accounting, so that the archives of Spain, of Portugal, and of their ancient colonies, examined with patience and interpreted with sagacity, have enabled the Humboldts, the Teraux-Compans, the Michel Chevaliers, the Jacobs, and Soetbeers to restore with approximate fidelity the figures representing the annual production of gold and silver from the mines of the New World.

"In the case of gold the progress was slow for two centuries, as may be seen from the following figures, which are those of Dr. Soetbeer:

PRODUCTION OF GOLD—ANNUAL AVERAGE.

Period.	Annual average for the period.	
	Fine ounces.	Value.
1493–1520	186,470	$3,885,000
1521–1544	230,194	4,759,000
1545–1560	273,596	5,656,000
1561–1580	219,906	4,546,000
1581–1600	237,267	4,905,000
1601–1620	273,918	5,662,000
1621–1640	266,845	5,516,000
1641–1660	281,955	5,828,000
1661–1680	297,709	6,154,000
1681–1700	346,095	7,154,000

"The production of silver during the same period had sextupled. In the case of gold the development of the American workings (200 kilograms per annum from 1493 to 1520; 7,750 kilograms from 1681 to 1700) was in part compensated by the decadence of the mines of Europe (at least 2,000 kilograms before 1520; 1,000 kilograms only in round numbers from 1545 to 1700) and by the decrease of imports from Africa (about 2,000 kilograms instead of 3,000 kilograms). In the eighteenth century the movement became accelerated in a very perceptible manner, but afterwards diminished greatly.

PRODUCTION OF GOLD—ANNUAL AVERAGE.

Period.	Annual average for the period.	
	Fine ounces.	Value.
1701–1720	412,163	$8,520,000
1721–1740	613,422	12,681,000
1741–1760	791,211	16,356,000
1761–1780	665,666	13,761,000
1781–1800	571,948	11,823,000

"This course of the production—first ascending and then retrograding—was due especially to Brazil. Central Europe continued to yield annually about 1,000 kilograms of fine gold, while Russia was still only assaying its placers; there was no progress in Africa, but the contrary; and New Granada (the Colombia and Venezuela of the present day), after having yielded 5,000 kilograms up to about 1760, also began to decline. Brazil took the lead and became for a time the country par excellence of gold production. Estimated at 2,750 kilograms per annum, the average figure for the period 1701 to 1720, its production rose to 8,850 kilograms from 1720 to 1740, and to 14,600 from 1741 to 1760. This represents almost three-fifths of the then total gold yield of

the two worlds. Only the Brazilian deposits were soon used up, and their annual tribute decreased, first by one-third and later by two-thirds, and even more.

THE NINETEENTH CENTURY.

"The nineteenth century is distinguished by events of a very different kind. These are so well known that a brief account of them will be sufficient.

"First among them during the ephemeral occupation of Spain by Napoleon was the insurrection of the Spanish colonies and the long war of independence that gave birth to the majority of the autonomous republics that stretch at present from the Gulf of Mexico to the Straits of Magellan. It is no wonder that such a crisis resulted in the interruption or retardation of the exploitation of American mines. Some of them were voluntarily flooded; in others there was a total absence of workmen, and it was only in 1825 that it was possible to begin to work them anew with the assistance of English and other capital. While hostilities continued the gold production of America declined by more than one-half (18,000 kilograms of gold from 1761 to 1780; less than 9,000 kilograms from 1811 to 1820). Russia, fortunately, began to increase its annual contingent considerably (3,375 kilograms of gold per annum from 1821 to 1830; 7,050 kilograms from 1831 to 1840, and 22,515 kilograms from 1841 to 1850.) The Russian Empire thus tended to become the great purveyor of gold for the civilized world, when an unexpected event in the middle of the century once more revolutionized the geography of gold.

"The successive discoveries of gold that so closely precede and follow the middle of our century are already ancient history. Gold was found about this time, first in the extreme West on the shores of the Pacific, and then in the extreme East on the Indian Sea; in 1848 Californian gold, and in 1851 Australian gold. The Old World was at this time greatly agitated, and the army of gold hunters had no difficulty in finding recruits. A universal fever raged, which was almost madness. There as everywhere gold had its favorites as well as its victims. Many who had started for the banks of the Sacramento did not reach even the threshold of the promised land. Thousands of emigrants were lost on the broad prairies of the far West or amid the snows of the Rocky Mountains; others perished at sea; and among those whose voyage had been less thwarted by the elements many became the prey of disease, to say nothing of the fact that many lost their lives in mutual strife in that distant Babel. By degrees, however, order came out of this chaos. Once the alluvions had been despoiled of the gold which was so easily separated from them, it became necessary to attack the rock itself to divert the water from its course, in order to disintegrate the rock, and to erect industrial plants for crushing the quartz. Capital began to move and mining companies to be formed. The primitive huts had become towns and the towns cities. Commerce and

culture vied with each other in their progress. And thanks to gold, an early and sudden civilization, in which gold now plays but a secondary part, in a few years transformed into one of the foremost States of the American Union the California which seemed destined for a long period to stagnate in solitude, silence, and sterility.

"In Australia similar events were taking place at the same time.

"The following table shows with what promptitude California and Australia doubled the production of gold:

PRODUCTION OF GOLD—ANNUAL AVERAGE.

Period.	Annual average for the period.		Period.	Annual average for the period.	
	Fine ounces.	Value.		Fine ounces.	Value.
1801–1810	571,563	$11,815,000	1851–1855	6,410,324	132,513,000
1811–1820	367,957	7,606,000	1856–1860	6,486,262	134,083,000
1821–1830	457,044	9,448,000	1861–1865	5,949,582	122,989,000
1831–1840	652,291	13,484,000	1866–1870	6,270,086	129,614,000
1841–1850	1,760,502	36,393,000	1871–1875	5,591,014	115,577,000

"Less than $20,000,000 up to 1848, and $120,000,000 to $140,000,000, beginning with 1850—a prodigious jump, certainly. Prices, as in the sixteenth century, necessarily felt the effect of this enormous increase in the world's yield of gold.

"Of the 200,000 kilograms of gold produced annually from 1851 to 1855, nearly 90,000 kilograms were obtained in the United States; that is, in California. Australia yielded 70,000 kilograms, or almost three times as much as Russia. From 1871 to 1875 Australasia and North America registered equal products—60,000 kilograms. Russia produced more than 30,000 kilograms. Of the remaining countries, none then reached 4,000 kilograms.

"Militant bimetallists who had so greatly mistaken the "future of gold," and who now seemed somewhat encouraged, were recently making a great outcry about what they called the "dearth of gold." Considering that the production of the yellow metal increased tenfold in less than twenty years, they preferred to take as a starting point of their comparative calculations the middle of the century, and chose to stop about 1883. There was indeed quite a noticeable reaction (but, as we shall see, only a temporary one) after the large yield which we have figured out. The following table is evidence of this:

PRODUCTION OF GOLD.

Calendar year.	Fine ounces.	Value.	Calendar year.	Fine ounces.	Value.
1876	5,016,488	$103,700,000	1881	4,983,742	$103,023,100
1877	5,512,196	113,947,200	1882	4,934,086	101,996,600
1878	5,761,114	119,092,800	1883	4,614,588	95,392,000
1879	5,262,174	108,778,800	1884	4,921,169	101,729,600
1880	5,148,880	106,436,800	1885	5,245,572	108,435,600

"Fifteen years ago the pessimists who exclaimed that gold was departing might well argue in support of their position that this metal, the demand for which it occurred to them was growing, was supplied in smaller and smaller quantities by gold-producing countries. The production of Russia, which had exceeded 43,000 kilograms in 1880, fell gradually to 33,000 kilograms, the limit which it reached in 1885. The Australian mines were languishing. At the beginning they produced for some years $60,000,000 and more annually. This came mainly from the colony of Victoria, with a small addition from New South Wales. But the richest gold fields having been rapidly exhausted, and new ones not having taken their place, the gold industry seemed about to perish, between 1876 and 1888 producing only about $30,000,000 (less than 40,000 kilograms fine in 1886), inclusive of the contingent of New Zealand. Lastly, the United States, whose production had exceeded $60,000,000 from 1852 to 1864, yielded, thirty years later, an amount less by one-half. Thus the phenomenon, although a fortuitous one, was general, and this state of things seemed to bolster up the claims of the apostles of bimetallism that the decline of wholesale prices was due to the downfall of silver and the enhanced value of gold.

"But chance, after having for a time favored this thesis, sprung an unpleasant surprise on those who had made it their creed, for, while prices continued to fall,[1] an unforeseen change took place and the extraction of gold from the mines of the world reached surprising proportions."

It was during the fourth period of the production of gold, treated of at the beginning of this essay, that these proportions were reached. It would be both interesting and instructive to dwell on the economic effects, whether probable or certain, of the stupendous increase in the yield of the world's gold mines during that period, but space does not permit us to do so; and even if it did, the writer deems it best to confine himself to a statement of facts and leave inferences from and speculation on them, to the reader, except where the conclusions to be drawn from them are self-evident and irresistible.

SILVER.

The production of silver from 1871 to the end of 1896—that is, from the date of the first legislative measure passed in the German Empire

[1] The index numbers of Mr. Sauerbeck, which, notwithstanding the imperfections of his system, give at least an approximate idea of the general movement of wholesale prices in England, run thus—the figure 100 representing the average level of prices during the years 1867 to 1877:

Year.	Index number.	Year.	Index number.	Year.	Index number.
1873	111	1888	70	1893	68
1879	83	1889	72	1894	63
1880	88	1890	72	1895	62
1886	69	1891	72	1896	61
1887	68	1892	68	1897 (3 months)	62

In India and Japan prices expressed in silver have risen about one-half during a quarter of a century.

looking toward the demonetization of silver, and before the limitation or suspension of its coinage by any other country—to January 1, 1897, was 84,274,679 kilograms, or 2,709,430,930 ounces, fine, of the coining value of $3,503,294,192.

The total production of silver from 1492 to the beginning of 1871—that is, from the discovery of America to the beginning of Germany's reform of its monetary system—was 170,983,450 kilograms, or 5,497,117,918 ounces, fine, of the value of $7,107,773,468. It appears from the above figures that the product of the silver mines of the world during the last twenty-six years was 49.2 per cent, or very nearly one-half of the amount extracted from them in the three hundred and seventy-eight years, from 1492 to 1871.

The average annual production of silver in the world from 1492 to 1871 was 452,337 kilograms, or 14,542,635 ounces, fine. During the years 1871 to 1896 it was 3,241,334 kilograms, or 104,208,888 ounces, fine—that is, seven times as much per annum as previous to the date of the so-called demonetization of silver.

The world's total production of silver from 1493 to 1896, or in four hundred and three years, was 255,258,129 kilograms, or 8,206,548,847 ounces, fine. Since during the last twenty-six years the world's production was 84,274,679 kilograms, it follows that since 1871 the amount of silver put on the markets of the world was 33 per cent, almost one-third of the total quantity extracted from the mines of the world in the four hundred and three years since America was discovered.

During the past five years, from 1892 to 1896, both inclusive, the amount of silver extracted from the mines of the world was 25,374,014 kilograms, or 14.8 per cent of the total production from 1493 to 1871, and 9.94, or very nearly 10 per cent, of the total silver production from 1493 to the end of 1896.

During the year 1873, when the standard silver dollar was dropped from the list of coins to be minted in the United States, the production of silver was 1,969,425 kilograms. In 1896 the production of silver in all countries of the world was 5,136,274 kilograms, or over 260 per cent of the world's product of silver in 1873.

The total value of both the gold and silver available for coinage, industrial consumption, etc., during the twenty-six years previous to 1871 was $742,048,300. During the last twenty-six years it was (at the ratio of gold to silver of 1.16) $3,344,391,900, or 450 per cent of the amount of both metals available for monetary and industrial purposes during the period of equal length preceding 1871.

Such an increase, within about a quarter of a century, in the production of the monetary metals is certainly sufficient reason why one of them should have been demonetized, or why, at least, the coinage of one of them should have been limited or suspended, if the world was to be spared a revolution in prices similar to that which took place in the

sixteenth century, and compared with which the decline of prices since 1871 is insignificant in the effects it has produced.

Which of the metals should have been demonetized, or at least have undergone a suspension or limitation of its coinage, need not be discussed here. That is a question which the civilized world has already decided, and which is no longer seriously debated, except indirectly in the United States when the free coinage of silver by this country, independently of the great commercial States on the other side of the Atlantic, is advocated.

The figures given above enable us to tell what the full effect of the free coinage of silver in the United States at the ratio of 1 to 16 would be. It would bring to our mints the silver product of the world, at present $213,000,000 coining value, less the industrial consumption of that metal, the silver coinage of Mexico and a few South American States, the fractional coinage of Europe and the United States from newly produced silver, and the export of silver to the East. The fractional coinage referred to is insignificant. The other items for 1896 are as follows:

Industrial consumption	$38,580,184
Coinage of Mexico	*a* 1,112,305
Coinage of South American States	5,227,833
Exports to the East	40,732,086
Total	85,652,408

Deducting this total from the silver production of 1896 leaves $127,347,592, the amount of silver which the United States would be required to coin of last year's production if we had the free coinage of silver at the ratio of 1 to 16. It is probable that the amount we should have to mint, on the supposition just made, would be even larger than this; for a price of $1.29 per ounce, fine, would attract to our shores much of the silver now shipped to the East, where it commands only $0.674 per ounce fine, and might draw some from the silver-burthened countries of Europe like France and even Germany which still has $100,000,000 in silver thalers. Nay, more, the raising of the price of silver from $0.674 to $1.29 per fine ounce would be quickly followed by increased production of the metal, so that it is safe to calculate that the amount of silver which the United States would be called upon to mint, if its coinage were free, would, in the next few years, average at least $200,000,000, since, under the stimulus of the enhanced price, it would not be many years before the world's production of silver would be doubled.

It is an instructive fact that the increase of the production of silver in the world has, on the whole, kept pace since 1871 with the decline

a This is the amount of Mexican silver coinage of 1896, less the exports of Mexican dollars and its recoinage of silver in that year. The exports of Mexican silver coin are embraced in "exports to the East."

of its price per ounce, fine; in other words, with the disparity between its coining and commercial values in the United States. The following table is proof of this:

TABLE SHOWING THE WORLD'S PRODUCTION, COMMERCIAL VALUE, COINING VALUE AT THE RATIO OF 1 TO 16, AND PRICE PER OUNCE, FINE, OF SILVER, FROM 1871 TO 1896, INCLUSIVE.

Years.	Fine ounces.	Commercial value.	Coining value.	Price per fine ounce.
1871	63,317,014	$83,958,000	$81,864,000	$1.326
1872	63,317,014	83,705,000	81,864,000	1.322
1873	63,267,187	82,120,800	81,800,000	1.298
1874	55,300,781	70,674,400	71,500,000	1.278
1875	62,261,719	77,578,100	80,500,000	1.246
1876	67,753,125	78,322,600	87,600,000	1.156
1877	62,679,916	75,278,600	81,040,700	1.201
1878	73,385,451	84,540,000	94,882,200	1.152
1879	74,383,495	83,532,700	96,172,600	1.123
1880	74,795,273	85,640,600	96,705,000	1.145
1881	79,020,872	89,925,700	102,168,400	1.138
1882	86,472,091	98,232,300	111,802,300	1.136
1883	89,175,023	98,984,300	115,297,000	1.110
1884	81,567,801	90,785,000	105,461,400	1.113
1885	91,609,959	97,518,800	118,445,200	1.0645
1886	93,297,290	92,793,500	120,626,800	.9946
1887	96,123,586	94,031,000	124,281,000	.97823
1888	108,827,606	102,185,900	140,706,400	.93974
1889	120,213,611	112,414,100	155,427,700	.93512
1890	126,095,062	131,937,000	163,032.000	1.04633
1891	137,170,919	135,500,200	177,352,300	.98782
1892	153,151,762	133,404,400	198,014,400	.87106
1893	165,472,621	129,119,900	213,944,400	.78031
1894	164,610,394	104,493,000	212,829,600	.63479
1895	167,288,729	109,406,800	216,292,500	.65406
1896	165,100,887	111,278,000	213,463,700	.67437
Total	2,585,659,188	2,537,360,700	3,343,073,600	.....

Reference was made a few paragraphs back to the decline of the price of silver since 1871. The controversy which has so long agitated this country will never be ended until the causes of that decline are fully understood by our people, nor until it is recognized that it was not produced by legislation and can not be remedied by the omnipotence of parliaments or congresses. The causes of the depreciation of silver since 1871, but especially since 1873, are set forth below. Many of the arguments elaborated in the following pages are from the published writings of Prof. W. Lexis, of the University of Goettingen, than whom no one in any country has more lucidly, learnedly, impartially, and scientifically written on the subject of the fall of silver and all topics cognate therewith.

THE DECLINE OF SILVER SINCE 1873.

Among the most notable events of 1896, from a monetary point of view and from the point of view of the production and employment of the precious metals, especially of silver, are the measures taken toward

the adoption of the gold standard by Russia and Japan, and the decline of the price of silver to 23⅝ pence, British standard, the lowest it has ever reached—one scarcely sufficient to cover the cost of production in a very great number of mines, and representing a ratio of about 1:40.

The going over of the two great nations named, with an aggregate population of 170,000,000, to gold monometallism and the subsequent remarkable fall in the price of silver are doubtless related phenomena, although other causes may, and very likely have, contributed to the reduction of the price of silver. It is not necessary to give here in detail the provisions of the laws enacted in Russia and Japan toward placing their respective currencies on a gold basis, as they are to be found in full in the appendix to this report; nor is there anything to be gained by speculating as to the time it will take to complete the monetary reforms they have inaugurated, or on the difficulties they will very likely encounter in bringing them to a successful termination. It is sufficient to remark that the action of Russia and Japan had naturally and necessarily a discouraging effect on the silver market, since it has now made it certain that the credit or "silver" rubles of Russia, which amounted at the end of 1895 to the nominal value of $900,000,000, will hereafter be redeemed not in silver, but in gold at the rate of 1½ paper credit or "silver" rubles for one gold ruble; and that Japan, which has hitherto been, *de facto* if not *de jure*, a single silver standard country, in which the free coinage of silver at the ratio of 1:16.18 prevailed, will before long be a market almost entirely closed to silver.

The monetary history of the world, like all other history, repeats itself. The coinage record of States is political economy teaching by example; and the causes for the further decline of silver in 1897 are similar to those that first produced and then accelerated its downfall since 1873, viz, the increase of the supply and the decline of the demand.

A careful study of monetary events since 1871 and of the market for silver in the various countries irrefutably establishes the truth of the following propositions:

1. The cause—one which of itself would have been all-sufficient—of the decline of silver since 1873 is the enormous increase in its annual production since that year—over 270 per cent in 1895 and 1896.

2. Other causes contributed to the dethronement of the metal, viz: The demonetization of it by Germany, Norway, Sweden and Denmark, and Roumania; the suspensions of its coinage into full legal-tender coins on private account by all the States of Europe and by every civilized government of any importance, except Mexico; the substitution, on a large scale, of council bills for shipments of silver to India, especially during the years 1873–1876.

3. The practical measures taken toward its rehabilitation by the United States proved abortive, affording no satisfaction either to the advocates or opponents of legislation in favor of silver.

4. The demonetizations and sale of silver by Germany and the Scan-

dinavian States do not account for the decline in the price of silver, because the aggregate of such sales since 1873 by all nations did not equal the silver product of any single year since 1893, and would constitute but a small part of the total yield of the mines since the sales began.

5. The suspensions of the coinage of silver by various nations since 1873 will not account for it, because, notwithstanding such suspensions, there has been incomparably more silver coined since then than in any period of equal length preceding it.

6. It follows as a corollary from the two foregoing propositions that the combined effect of the demonetizations and suspensions did not cause the decline.

7. The decline was not caused by the increase in council bills sent as payment to India instead of silver, since that increase ceased to operate fifteen years ago.

The supposition that silver began to decline only in 1873 is an erroneous one. Previous to that year it had, on the whole, been depreciating, as compared with gold, for centuries.

The Latin-Union ratio of 1 : 15½, which results from the average prices of gold and silver at the end of the last century and the beginning of the present one, is evidence that even then there was a decline of the value of silver. At the commencement of the sixteenth century the ratio was 1 : 10.75. It was 12.25 during the first twenty years of the seventeenth century, 14.50 between 1641 and 1660, 15.27 at the beginning of the eighteenth century. There was then a change favorable to silver; by degrees the ratio rose to 14.56 between 1751 and 1760. It afterwards fell, and eighty years later—that is, from 1841 to 1850—it reached 15.83. After a transitory rise to 15.36 and 15.48 in the two following decennial periods, the ratio by a precipitous decline fell to the level at which we find it to-day.

We thus see that there has been a progressive decline of the value of silver from century to century. The way had long been paving for its dethronement, which was consummated when the means of production and transportation had been transformed and the number, extent, and rapidity of commercial transactions increased. The countries which up to that time had remained faithful to silver abandoned it and adopted gold as their ruling standard.

The more modern fall of silver began as far back as 1867. The report of the French monetary inquiry of that year called attention to this depreciation and to its causes, which it found to be the enormous increase of the production of silver and the disfavor felt by people in commercial circles for that metal. In 1871 and 1872, before Germany had begun to demonetize its silver coins, the decline had become quite perceptible.

The table showing the fluctuations of the commencial ratio of silver to gold, published in the appendix to the report, is evidence of the

enormous decline of the value of that metal. From 1870 to 1897 commercial ratio of value between the two metals fell from 15.57 : 1 to 40 : 1—that is, it now requires 40 ounces of silver instead of 15.57 twenty-seven years ago to purchase 1 ounce of gold.

The agitation in favor of the gold standard commenced before 1871.

Beginning with the last years of the period 1860–1870, most countries of the European continent were considering the question of the adoption of gold as their sole monetary standard. A movement in this direction was taken in 1856 by the great commercial city of Hamburg. In France an international conference was called by the Government in 1867, at which the majority of civilized States were represented. It instituted an inquiry into the various questions relating to gold and silver, and especially into the utility and opportuneness of abandoning the double standard for the single gold standard. In this monetary inquiry, conducted by the superior council of agriculture and industry of France, only eleven experts favored the continuance of the double standard; twenty-four favored the single gold standard. The report, summing up the results reached by the committee of inquiry, concludes in the following words: "The majority of the experts whose testimony was given were of opinion that the system of the single gold standard is the only one which can serve as a basis of monetary unification." The same report gave as the motives for abandoning the double standard the very great increase of the production of silver:

> The annual production of silver, which did not exceed $40,000,000 in 1847, is now estimated at $100,000,000; it increases, while that of gold remains stationary or diminishes slightly. Silver tends to depreciate in the markets of the world; gold, on the contrary, is in demand. More than $100,000,000 in silver 5-franc pieces have already been accumulated in the Bank of France, and the public are no longer willing to accept these heavy pieces. Silver, therefore, seems to be falling into disfavor, and we should make haste to demonetize it, unless we wish to be the last to be encumbered by that inconvenient and burdensome metal.

The same document stated that "silver coin had not only the material disadvantage of being heavy and cumbersome, but the further drawback that in order to use less of it the Government was forced to increase beyond measure the circulation of paper," and it gave as an example North Germany. It also alluded to the very marked movement in Germany for the demonetization of silver and the adoption of the gold standard, in which case, it remarked, the gold circulation of France would be imperiled. It likewise called attention to the fact that the double standard is the alternative standard, and that it might become in France the single silver standard.

Thus there was, beginning with 1867, a very active movement in Europe in favor of the single gold standard. The increase in the production of silver and the decline of that metal, although still small, began to create disquiet in the minds of some of Europe's best statesmen and economists. Paul Leroy-Beaulieu considers it unfortunate

that France did not in 1867 follow the advice of its most experienced men, Michel Chevalier and De Parieu, and of the majority of the witnesses called by the Committee of Monetary Inquiry of that year. He thinks that if she had then adopted the single gold standard and anticipated Germany her monetary situation would be much superior to what it is. She would have been able, he says, without great loss to have demonetized $200,000,000 worth of silver. Moreover, she would not have had the $90,000,000 of silver coin stamped under the Third Republic (1870–1876); and, lastly, she would not have been encumbered by the Italian and Belgian stocks of 5-franc silver pieces, which it will be difficult, at least for Italy, to redeem in gold. By adopting the single gold standard in 1867 France would have been able, without any great sacrifice to the treasury, to reduce to, at most, $200,000,000 the stock of 5-franc silver pieces remaining in the country—a sum which would not have been excessive, used as token money, to which the people had become habituated.

"Now, on the contrary," Leroy-Beaulieu continues, "that France holds $600,000,000 worth of silver, both in national and foreign coins, and that the metal is losing commercially between 55 and 60 per cent of its monetary value, she is forced, unless willing to make enormous sacrifices while adopting the gold standard, to keep as subsidiary coin an amount of silver altogether superabundant, especially if she can not prevail on Italy to take back the silver coins stamped in that country which now circulate in France."

Reference was made above to the decline of the price of silver in years long past. But in recent times, instead of the slow oscillations in the price of silver that occurred in previous centuries and in the present up to 1873, there has been an unusually rapid and on the whole continuous decline—a decline which has sometimes been interrupted, it is true, by rises in the price of the metal, but which has never been long interrupted.

The world's market for silver is in London, and the price is there quoted in pence per ounce standard, the fineness being 0.925. The French ratio of value of gold to silver of 1:15½, which was formerly considered almost universally the normal ratio, corresponds to the London price of $60\frac{13}{16}$ pence. The greatest deviations from this ratio previous to 1870 were in the years 1845 and 1847, when the price declined to $58\frac{7}{8}$ pence, in April, 1848, when it fell to $58\frac{1}{2}$ pence, and in July, 1859, when it rose to $62\frac{3}{4}$ pence. The London price corresponding to the United States ratio of 1:16 is 59 pence.

The revolution in the condition of the silver market coincides in point of time with the changes made in the sixties by several States in their coinage; and there can be no doubt that these monetary measures contributed to the depreciation of silver, and that some of them had the same effect by partially removing the obstacles which prevented the decline of the price of that metal.

After her victories in 1870–71, Germany, equipped with the resources of the colossal war indemnity, $1,000,000,000, which she had obtained, decided by the laws of December 4, 1871, and July 9, 1873, to demonetize silver as full legal tender money and to adopt the single gold standard.

Imitating Germany, the Scandinavian countries, Norway, Sweden, and Denmark, concluded, in 1872, a monetary treaty for the demonetization of silver, which was ratified by Sweden and Denmark in 1873 and by Norway in 1875. By this treaty these powers adopted the single gold standard and retained silver only as subsidiary coin, which could be stamped only on Government account.

To the quantities of silver extracted from the mines there were added, beginning in 1873, the amounts sold by the German Empire and the Scandinavian countries after they had adopted the single gold standard. The sales of silver by the Scandinavian countries were insignificant. They have been estimated at 225,000 kilograms, or 7,233,750 ounces, of the coining value of $9,331,500. Germany has sold 3,602,848 kilograms, or 115,832,530 ounces, of the value of $149,423,965. To these amounts must be added the sales of silver by Roumania, amounting to $4,675,000, equivalent to about 112,500 kilograms, or 3,616,875 ounces. If any other Government made any sales of demonetized silver up to the present year they have been insignificant. The total amount of silver, therefore, demonetized and sold since 1873 amounts in round numbers to 4,040,348 kilograms, or 126,683,156 ounces, of the value of $163,430,460. This total does not equal the production of silver in a single year since 1893, beginning with which the world's production of silver has exceeded 5,000,000 kilograms per annum.

While the supply of silver was thus increasing the demand for it was decreasing both in Europe, America, and Asia.

The total production of silver from 1873 to the end of 1896 was, approximately, 76,000,000 kilograms. Now, as the amount actually demonetized was only 4,040,348 kilograms, it constituted only about 5 per cent of the total production of silver during the twenty-three years beginning with 1873 and ending with 1896. During the period of equal length preceding 1873—that is, in the twenty-three years beginning with 1849 and ending with 1872—the production of silver was about 15,875,000 kilograms. The world's yield of silver was, therefore, over four times as great in the period 1873–1896 as in the period of equal length, 1849–1872. Taken in connection with the fact that the demand for silver was continually lessening during the former period, these figures are sufficient to show what part the demonetization of the metal played in producing its decline since 1873, and what share its enormously increased production had in the same.

The total amount of silver demonetized and sold by Germany, Norway, Sweden, Denmark, and Roumania, viz, 4,040,348 kilograms, distributed over the twenty-three years since 1873, would give, as the share

of each year, 175,667 kilograms. If the sales of these countries of the silver they had demonetized were equally divided over the entire period, this is the amount of fine silver the above-named countries would have put upon the market each year, and by which they would have swollen the quantity extracted annually from the mines; that is, during the last four years, for instance, the sales would have increased the amount put on the market by less than 3½ per cent. Nearly all, however, of the silver demonetized was sold before 1879; and the effect of its being placed on the market was felt very soon after the sales began in 1873.

So much for the actual demonetization of silver after 1871. It is very important to draw a clearly defined distinction between the demonetizations of silver by the countries already named and the restrictions, limitations, or suspensions of its coinage by other countries that followed as the direct and necessary consequence both of these demonetizations and of the simultaneous large increase in the quantity of silver extracted from the mines of the world, but more especially of the United States. The demonetizations by Germany and the Scandinavian nations deprived their full legal-tender silver coins of the character and quality of money. Demonetization transformed these coins into a commodity—silver bullion. The demonetizations increased the supply while they lessened the demand for silver. The restrictions, limitations, and suspensions of the coinage of silver by several countries lessened the demand for the metal, but as they left to the full legal-tender coins already in existence the character of money, and did not necessitate their being melted down and sold, they did not increase the supply of silver.

Germany began the sales of the silver derived from its demonetized coins as early as 1873, and in 1874 the price having fallen to a point at which it became profitable for brokers to purchase silver in Germany and ship it to states comprising the Latin Union for conversion into 5-franc pieces, the parties to the monetary convention of the Union decided in 1874 to limit the amount of 5-franc pieces to be coined by each. This, however, did not have the effect to steady the price, and in 1878 the mints of France, Belgium, Switzerland, Italy, and Greece were closed to the coinage of full legal-tender silver coins, and have remained so ever since. This action of the Latin Union, as Professor Lexis has observed, deprived silver of the refuge which had thus far sheltered it most securely, and for the longest time, against the influence of the German and Scandinavian sales and the progressive increase of the production—the French mint. In the first twenty years after the Californian and Australian discoveries gold would doubtless have declined much more as compared with silver than it actually did if it had not found in France a wide open market, while at the same time 1,800,000,000 francs in silver could be taken thence without any great increase of its price.

Only a few voices were raised in France against this outflow of silver. Public opinion, as a rule, looked upon it with indifference, and considered the enormous import and coinage of gold (over 6,000,000,000 of francs) as a great advantage to the country. On the other hand, when silver began to depreciate, the inflow into France and Belgium of a few hundred millions of francs in silver and the thought of the possibility of an increasing gold outflow was sufficient to create great uneasiness in both countries and to induce them to restrict the coinage of silver. This fact shows conclusively that public opinion in our day does not look upon gold and silver as equally good for monetary purposes, and that it has a decided preference for the former. Indeed, silver in Europe has fallen into a kind of disfavor. It is abandoned for gold because gold is much better adapted to the wants of an extremely active circulation. "This fact must be reckoned with," says Lexis, "even if it is based on nothing more than prejudice."

France's influence in maintaining the value of gold in the fifties and sixties is to be ascribed only partly to the peculiar operation of the double standard. Its value was maintained only so long as the increased import of gold into France was offset by an export of silver, perhaps not quite as great as the import of gold, but still very large, and the price of silver stood perceptibly above the normal rate—that is, up to 1865. After that year, France imported not only more gold but more silver than it exported. As a consequence, the price of the latter metal again declined temporarily below the so-called par, and the coinage of silver reached once more large proportions, beginning with the year 1867. After 1865, therefore, France acted on the value of gold, only as a country with the single gold standard, would have done.

The mechanism of bimetallism serves only to facilitate the importation of the metal that is growing cheaper, while it operates a simultaneous exportation of the other. The best thing that can be done to insure the complete maintenance of the value of one of the precious metals, when its production is greatly increasing, is to provide it with as large a territory as possible, in which it may be coined into pieces of the same nominal value as those that are already legal tender there, and to make it legal tender in payment of all debts, even of existing ones.

Of course, when there is a continuous and great increase of the metal, there may be a gradual decrease of its purchasing power over commodities, and therefore a gradual increase of prices; and although gold, in the fifties, declined in value but little as compared with silver, there is no doubt that at that time both gold and silver, which were then bound together by French bimetallism, declined in purchasing power considerably as compared with commodities, and that there was therefore a rise of prices.

If we inquire how far the influence of the coinage would have had to

go in order to keep gold during that period in a state of relative fixity of value, we find that in the years 1851 to 1870, while the production of gold was valued at $2,595,996,000, there was a gold coinage in Europe, America, and Australia of $3,005,226,000. From this latter sum we must deduct the Russian coinages, which amounted to about $285,000,000, as these coins were almost entirely exported to western Europe, melted, and recoined. Leaving out of consideration other recoinages, it appears that about 52 per cent of the newly produced gold must have been definitively employed in coinage in order to insure the stability of the value of that metal as compared with silver, and to make its diminution in value as compared with other commodities slow, steady, and almost imperceptible.

If at that time the coinage of gold had been universally restricted or suspended, there would undoubtedly have appeared a similar difference of value between gold in the form of coin and bar metal as has appeared since 1874 between silver coins and silver bars in countries with the limping double standard like France and the United States.

Holland, which in 1847 had adopted the single silver standard, followed the example of Germany in 1875, *de facto* if not *de jure*. It nominally adopted the double standard at the ratio of $1:15\frac{5}{11}$ between the two metals and prohibited the coinage of silver, which made it a country with a gold circulation.

The silver coinages of Holland had been, up to 1874, very large, because the mother country coined silver for the Dutch Netherlands also, and the loss of that market to silver dealt a further blow at the metal.

The abolition of the double standard in the United States in 1873 in favor of the gold standard was of less importance than the action of Germany and Scandinavian nations, for the reason that it was still under a paper-money régime. But the law of February 12, 1873, had at least one plain effect: It prevented the flow into the United States of the silver which had been demonetized in Germany, Sweden, Norway, and Denmark, and which for some years subsequent was in search of a market.

In 1876 Russia completely suspended the coinage of full legal-tender silver, but allowed the coinage of such pieces as might become necessary to carry on its trade with China.

Austria-Hungary, which had nominally the silver standard but which was actually on a paper basis, suspended the coinage of silver in 1879 because it had come to be of less value than paper money, and in 1892 it formally adopted the single gold standard, a reform which it is still in process of effecting.

On the 26th of June, 1893, the legislative council of India passed a bill closing the mints of the country to the coinage of silver on individual account.

The United States, by an act of November 1, 1893, repealed the purchasing clause of the act of July 14, 1890, which had taken the place of

the Bland Act, the object of both of which was the obligatory purchase of silver to a stated amount every month by the United States Treasury.

Chile adopted the gold standard in 1895.

The recent action of Russia and Japan has already been alluded to.

Such is the series of demonetizations and suspensions of the coinage of silver by the great civilized powers since 1871, England having prohibited the coinage of silver in 1798 and adopted the single gold standard in 1816, as Portugal did in 1854.

It is a curious fact that in double-standard countries the final substitution of gold for silver and the downfall of the latter were precipitated by the temporary decline of gold after 1850. One of the consequences of a bimetallic system is to cause the export of the metal which is at a premium and the import of the one which is losing in value. After 1850, as a result of the natural action of the double standard, gold was imported into France and into the countries of the Latin Union, and was substituted in them for silver. Gold, with which the people of these countries were almost entirely unacquainted, was first received by them with distrust. But it was soon appreciated. New monetary habits were formed. After 1872, when silver became depreciated, and might in consequence have driven gold out of these same countries, their Governments took measures to prevent the substitution of silver for gold and to keep the latter metal in circulation. As has been already stated, by almost common agreement they closed their mints to the coinage of silver.

The suspension of the coinage of silver by the Latin Union, and subsequently by every European State, followed by the closure of the mints of India to its free coinage, and of those of the United States to even the limited coinage of full legal-tender silver coins on private accounts, reenforced the action of Germany and other European States in demonetizing silver; but the limitations and suspensions of the coinage of that metal, as we shall yet take occasion to demonstrate, while they evidently contributed to its depreciation, were not the main cause of its fall. Nor were they and the suspensions combined. Indeed, the limitations and suspensions, and to a less degree the demonetizations, are rather the effect than the cause of the depreciation of silver. The fall of that metal would have taken place, although perhaps in smaller, but still very great proportions, if no change had been made since 1871 in the monetary organization of the different countries.

To a close observer it is unquestionable that the legislative measures enumerated above were, as just remarked, dictated by the decline of silver, and did not cause that decline; and this all the more as they were offset in great part by other legislative measures, especially the Bland Act and the Sherman Act. The facts undoubtedly prove that even if all States had abstained after 1870 from making any modification in their monetary legislation a formidable decline of silver would have nevertheless taken place, although the depreciation might have been a little less serious and a little less rapid.

That fall tended to become ever greater, because of the enormous increase of the production of silver. The average amount of silver produced annually, which was only 780,415 kilograms, or 25,090,342 ounces, of the coining value of $32,440,000, in the period 1841–1850, increased to 1,339,085 kilograms, or 35,401,972 ounces, of the value of $45,772,000, in the period 1866–1870, and then to 1,969,400 kilograms, or 43,051,583 ounces, of the value of $81,864,000, in the period 1871–1875, and to 2,450,300 kilograms, or 78,775,602 ounces, of the value of $101,851,000, in the period 1876–1880, having thus more than trebled since the ten-year period 1840–1850, although the commercial value of silver had fallen enormously. Since 1893 the annual production of silver is more than six times that of the period 1841–1850, although silver has lost commercially from 40 to 60 per cent of its value. This formidable increase of production is the main and all-sufficient reason of the extraordinary decline of silver since 1871.

The measures taken by the United States, beginning with 1878, largely offset the closure of the mints of Europe. The Government of the United States purchased under the Bland Act of February 28, 1878, up to the 13th of August, 1890, the enormous amount of 291,272,018 ounces, at a cost of $308,279,260, and during the shorter period from the 13th of August, 1890, to the 1st of November, 1893, under the Sherman Act, the comparatively larger amount of 168,674,682 ounces of silver, at a cost of $155,931,002.

The Bland Act restored the standard silver dollar, which had been dropped from the coins to be minted by the law of February 12, 1873, and provided that the Secretary of the Treasury should purchase monthly and coin from $2,000,000 to $4,000,000 worth of silver. The price of silver nevertheless declined further, probably in consequence of the encouragement given to production by these obligatory purchases, since the product rose to 2,500,000 kilograms in 1878 against 2,389,000 in 1877. A new minimum was reached March, 1879, when silver fell to $48\frac{7}{8}$ pence.

The price of silver rose again to $53\frac{3}{4}$ pence in October, 1879. Then during nearly three years, 1880–1882, it oscillated about 52 pence. But, beginning with 1883, under the influence of an ever-increasing production, it began to decline again. It stopped, momentarily, in July, 1886, at the rate of 42 pence. There was a slight rise at the end of 1886 and the beginning of 1887, caused, probably, by a momentary increase in the imports into India. But in 1888 silver fell to $41\frac{5}{8}$ pence. The United States Congress now made a new attempt toward the rehabilitation of silver. Numerous bills were introduced, both in the Senate and House of Representatives, with that view. Mr. Windom, Secretary of the Treasury, in December, 1889, departing from the reserve of his predecessors, took himself the initiative in the movement. His proposals were not accepted.

But on the 14th of July, 1890, an act, generally known as the Sherman Act, was passed, providing for the monthly purchase of 4,500,000

ounces of silver at the maximum price of $1 for 371¼ grains of fine silver. The price of silver, which rose constantly while the debates in Congress on this subject were going on, reached, in September, 54⅝ pence. It fell almost immediately because the production, which had been overstimulated by the high price of the metal, reached, in 1891, 4,466,000 kilograms. In December, 1891, silver was quoted at 43½ pence, and in March, 1892, at 39 pence.

The United States then called an international monetary conference to find means to increase the use of silver. The conference met at Brussels November 22, 1892. On the 17th of December the delegates adjourned without having passed any resolutions. In 1893 the decline of silver became aggravated to such an extent and inflicted such losses on the countries that continued its coinage that, as already stated, India, by a law of June 26, 1893, closed its mints to the coinage of silver, and the United States Congress, in extraordinary session, repealed the purchasing clause of the act of July 14, 1890, on November 1, 1893. In December, 1893, the price fluctuated between 30 and 31 pence. In February, 1894, it fell to 29$\frac{15}{16}$ pence. In September, 1897, we find it as low as 23⅝ pence.

The necessary conclusion of this exposition is that the depreciation of silver results from the modifications that have taken place in the supply and demand of the metal and is preponderantly due to the increase of production, being in 1896 over 400 per cent greater than in 1872.

Undoubtedly [says Professor Lexis] the suspension of the coinage of silver in several of the most important civilized States, together with the German and Scandinavian sales, contributed materially to the depression of the price of that metal. It would not, however, have fallen much below its former price if its annual production had continued at the same figure as at the beginning of the fifth decade of this century. It still found in India and China so great an outlet as a money metal that an overloading of the European market with it could not, on the supposition just made, have taken place. Up to the present time it has not by any means been deprived of the quality or character of a monetary metal.

During no former period had so much silver been employed, even approximately, every year in coinage or used in some other way (especially as a deposit against paper money) for monetary purposes as there has been in the present. Leaving Mexico and the South American States entirely out of consideration, there were coined in Europe, the United States, and India in the years 1851 to 1860 an annual average (at the old ratio of 1 : 15½ and 1 : 16 principally) of $38,794,000. During the decade 1861–1870, when the production of silver in the West of the United States began to be developed and when the cotton famine enormously increased the payments due to India on account of international trade, this annual average coinage amounted to $80,020,000. But even this figure, which up to that period had never been reached, is exceeded by the average amount of coinage (Mexico and South America not included) in the years 1887 to 1891, when the price of silver had fallen as low as 43½ pence in London. The average coinage of those years amounted to no less than $113,000,000 (at the old ratio of value), and this sum does not include the storage of silver bullion by the United States after August, 1890. The large silver import into China, which to a great extent consists of Mexican dollars and which may also be considered as a monetary employment of silver, is also left out of account in the above average figures.

The known aggregate coinage of silver during the sixteen years 1876–1891—that

is, during the period of the greatest depreciation of the metal—amounted to $2,110,560,000 at the old ratio. From this we must deduct $71,000,000, which were recoined from old coins into German and Scandinavian divisional coins, but this amount is offset by the monetary silver bullion stock of the United States created under the law of July 14, 1890.

Moreover, this sum embraces about $950,000,000 of Mexican piasters, one-half of which may have served as coinage material. The remainder went to China, or may be considered the equivalent of the bar silver exported to China, and which serves monetary purposes. The net silver coinages, therefore, of this metal, would have to be put at at least $1,560,000,000. On the other hand, the production of silver during the same period, according to Soetbeer, amounted to $2,109,394,000. Thus the net coinage was fully 74 per cent of the production, while the gross amount of coinage shows that a quantity of silver as large or even larger than that of the silver newly produced passed through the mints. So far, therefore, was silver after its so-called demonetization from having lost any of its employment as a monetary metal that it may be truly said that it was employed in coinage in larger proportions than was gold in the period from 1851–1870.

The coinage of silver, it is true, has been suspended in France. It can no longer be turned, for the convenience of holders, into 5-franc pieces, but in lieu thereof it has found a place in the currency of the United States to the amount, annually, of $70,000,000—a sum six times as great as the average annual coinage of France during the time of silver's supremacy. But while the silver absorption of the United States for monetary purposes is large it is also strictly limited, and the remaining markets for silver as material for money are not included within the limits of European civilization, and hence the use of silver there is not possible to the same extent or in the same mode as in Europe. Not only do European products exceed in variety and value the raw agricultural products of Asiatic countries, but Europe has far greater opportunities for the investment of capital and also for the purchase of governmental and industrial securities. But considering the vast production of silver at the present time it could never be restored to its former value as compared with gold even if all the mints of Europe were again open to it under the conditions that formerly prevailed.

Confirmatory of the above views given of Professor Lexis is the following table, giving by 5-year periods the silver coinage of the principal countries of the world since 1851, exclusive of the coinages of Mexico and India, both before and since the beginning of the great depreciation of silver. The coinage of Mexico is not included, because, although the silver stamped in that Republic serves to a limited extent at home and in other countries a monetary purpose, by far the greater part of it is exported from Mexico practically as bullion, and will be accounted for as exports to the East. That of India is also omitted, because it, too, more properly comes under the same head of exports to the East.

SILVER COINAGE OF THE PRINCIPAL COUNTRIES BY QUINQUENNIAL PERIODS FROM 1851 TO 1895.

Period.	Amount.	Period.	Amount.
1851–1855	$21,780,808	1876–1880	$82,752,600
1856–1860	43,901,004	1881–1885	53,335,800
1861–1865	33,673,668	1886–1890	68,721,548
1866–1870	55,795,768	1891–1895	77,442,225
1871–1875	66,068,800		

If we compare the silver coinages of the principal countries during the twenty years previous to 1873 and the twenty years subsequent, we find the following results:

Period.	Silver.	Average silver coinage per annum.
1853–1872	$864,332,224	$43,216,611
1873–1892	1,377,140,590	68,857,030

Thus the total silver coinages of the principal countries during the twenty years subsequent to 1873 have been over 62 per cent greater than the silver coinages during the twenty-three years previous thereto.

It seems clear from the facts, figures (and arguments) given above that the main cause of the depreciation of silver since 1873 is not to be sought for in the restrictions and suspensions of its coinage in almost all civilized countries since 1874, any more than in the demonetization of it in Germany and the Scandinavian States in 1871–1873. These causes, however, contributed to the decline of the metal, as did also, for a time, the substitution of council bills for shipments of silver to India.

Beginning with the Indian fiscal year 1871–72 the nature and mode of the financial relations of India with England were greatly modified. The British Government recouped its expenses in India by making on the colonial government drafts called India council bills, which are sold in London to the highest bidder. These council bills are bills of exchange which the Indian office in London, which has always large payments to make in Europe for interest, pensions, and other objects, draws on the Indian treasury and sells continually in large lots. A person who has payments to make in India can choose between these council bills and the actual shipping of silver. There is, therefore, a very active competition between silver and council bills.

During the period of the construction of Indian railways the drawings of the Indian office were greatly reduced for the following reasons: The railways were constructed by English companies under a guaranty of interest. Their capital, almost all of which was subscribed for in England, was paid into the hands of the secretary of state for India. The purchases of rails, locomotives, and cars made in England absorbed 40 per cent of this capital. The remainder, about 60 per cent, was expended in India in the construction of the roads. The secretary of state had thus simultaneously to remit funds to India and to receive payments from India. He offset one against the other as far as the amounts would allow. His drawings were diminished by so much. Trade having fewer bills available, was obliged to ship silver to India. When the works were terminated the Indian office drew bills for the sum total of the amount due the United Kingdom. As the remittances by the bills increased, the quantities of metal sent to India diminished. The following figures show the remittances made to India in specie and

in council bills from 1868–69 to 1871–72 on the one hand, and from 1872–73 to 1875–76 on the other:

	Specie.	Council bills.
From 1868–69 to 1871–72	£40,000,000	£29,500,000
Annual average	10,000,000	7,400,000
From 1872–73 to 1875–76	16,500,000	50,500,000
Annual average	4,100,000	12,600,000

In 1875–76 the remittances amounted to only £3,100,000 in specie, against £12,400,000 in council bills.

The facts above stated are sufficient to explain why the price of silver fell in January, 1876, to 54⅞ pence and subsequently to 46¾ pence. After 1876–77 the Indian market for silver became less restricted than previously. The net imports of the metal were larger than those of the preceding period. But the issues of council bills also increased. The following are the figures for the years 1876–77 to 1896–97:

NET IMPORTS OF SILVER INTO INDIA, AVERAGE RATE OF INDIAN RUPEE, AND AMOUNT OF COUNCIL BILLS SOLD FOR FISCAL YEARS (ENDING MARCH 31) FROM 1872 TO 1897, INCLUSIVE.

Years.	Net imports of silver.	Average rate of Indian rupee.	Amount of council bills sold.
1872–73	$3,298,985	22.750	$67,834,606
1873–74	11,311,401	22.351	64,654,752
1874–75	20,916,698	22.221	52,760,715
1875–76	6,826,414	21.645	60,294,052
1876–77	29,911,149	20.491	61,784,106
1877–78	61,869,640	20.790	49,319,325
1878–79	15,910,390	19.761	67,880,692
1879–80	31,852,848	19.961	74,271,598
1880–81	15,751,280	19.956	74,163,888
1881–82	21,699,764	19.895	89,604,086
1882–83	29,614,971	19.525	73,584,015
1883–84	25,372,923	19.536	85,649,451
1884–85	28,367,364	19.308	66,957,731
1885–86	42,960,530	18.254	50,089,386
1886–87	25,306,454	17.441	59,061,202
1887–88	31,623,459	16.899	74,742,515
1888–89	30,709,917	16.379	69,410,203
1889–90	36,741,437	16.566	75,306,635
1890–91	51,993,287	18.089	77,713,304
1891–92	30,611,949	16.733	78,320,740
1892–93	39,083,615	14.984	80,454,024
1893–94	40,466,665	14.546	46,378,884
1894–95	16,812,318	13.100	82,268,679
1895–96	18,206,409	13.641	85,278,507
1896–97	17,163,142	14.454	76,028,915

The quantities of silver therefore absorbed by India remain, as a rule, equal to those of the period comprised between the Indian fiscal years

1862–63 and 1869–70, but the council bills or drafts on India representing as they do much larger sums, their sale in London could not fail to affect the price of silver just as sales of that metal would have done.

The imports of silver, which were very large from 1862 to 1866, were the consequence of the purchases of cotton which European industry, cut off from the United States market by the war of secession, was compelled to make in British India. When the American civil war ended cotton from the United States resumed the place that Indian cotton had temporarily occupied, and Europe had to send less silver to India.

In the years 1865–1870 the amounts of council bills actually sold fluctuated between 41,000,000 and 68,000,000 of rupees; but in the fiscal year 1870–71 they amounted to 90,000,000 of rupees; in 1871–72, to 143,000,000; in 1874–75, to 117,000,000; in 1875–76, to 137,000,000, and in 1876–77 to 149,000,000 of rupees. This increase of council bills had undoubtedly in the earliest period of the depreciation of silver contributed to that depreciation, but in the subsequent period it is impossible to discover any definite connection between the amount of council bills and the average price of rupees or bar silver. The average annual value of these bills in sterling has not increased since the year 1880, but the corresponding amount of rupees nevertheless rose with the decline of the price of silver. In the year 1881–82, 222,000,000 of rupees in council bills were sold for £18,400,000, at an average price per rupee of 19.9 pence; in 1888–89, 209,000,000 rupees in council bills yielded only £14,300,000 (i. e., 1 rupee=16.38 pence); in 1889–90, 224,000,000 of rupees sold for £15,500,000 (1 rupee=16.57 pence); in 1890–91, 220,000,000 of rupees brought £15,970,000 (1 rupee=16.09 pence). The demand of the Indian Government in England for money met by council bills has therefore in recent years decreased as compared with the years 1880–86, and hence the pressure bearing down the price of silver must have come principally from the increased supply of bar silver.

The total export of silver from London to India, the Straits Settlements, and China from 1881 to 1896, was as follows:

Years.	Ounces.	Years.	Ounces.	Years.	Ounces.
1881	19,850,000	1887	23,990,000	1893	53,803,000
1882	27,540,000	1888	25,530,000	1894	43,673,000
1883	33,440,000	1889	39,310,000	1895	29,349,000
1884	39,230,000	1890	41,400,000	1896	31,502,800
1885	37,180,000	1891	33,650,000		
1886	25,820,000	1892	54,523,000		

In 1892, during which silver fell to a price lower than ever before, the export to the East was greater than ever before, and in the first half of 1893 the outflow was also unusually large. Every effort is

made, no matter what the cost, to utilize this metal in eastern Asia by exchanging it for the products of those countries, which of course, to the extent that they are produced in Europe also, meet with considerable competition in European markets.

It can not yet be definitely said that in India the depreciation of silver has caused wages or the prices of the common products of the country expressed in rupees to rise. The price of Indian wheat in 1891 was indeed higher than almost ever before, except in such famine years as 1873, 1874, 1877, and 1878. But this high price of wheat was not caused by the low price of silver, but by the bad harvests in Europe and the economic condition of the country in general. In the case of rice, which is of more importance to the Indian people as food than wheat, there was no rise as compared with the average price.

There are also large amounts of silver shipped from San Francisco to China and Japan, and these amounts must be added to those already given. They amounted, for instance, in 1888 to $8,897,500, in 1889 to $12,992,890, and in 1890 to $6,579,433, and in the fiscal year 1891–92 to $8,082,270, and 1895–96 to $4,853,668.

The substitution of the sale of council bills for silver affected the market of the metal only for a few years about twenty years ago, while the total amount of silver shipped to the far East has been larger since 1873 than before. The decline, therefore, can not be laid to the loss of that market.

An impartial survey of all the facts lead to the conclusion that the great cause of the decline since 1873 is the increased production of the metal.

In the years 1866–1870 the production of silver increased from an annual average of 1,101,150 kilograms or 35,401,972 ounces, of the coining value of $45,772,000, to a yearly average of 1,339,085 kilograms or 43,051,583 ounces, of the coining value of $55,663,000. In the year 1871 it rose to 1,969,425 kilograms or 63,317,014 ounces, of the value of $81,864,000, and in the following years its production was as follows:

Years.	Fine ounces.	Years.	Fine ounces.	Years.	Fine ounces.
1872	63, 317, 014	1881	79, 020, 872	1889	120, 213, 611
1873	63, 267, 187	1882	86, 472, 091	1890	126, 095, 062
1874	55, 300, 781	1883	89, 175, 023	1891	137, 170, 919
1875	62, 261, 719	1884	81, 567, 801	1892	153, 151, 762
1876	67, 753, 125	1885	91, 609, 959	1893	165, 472, 621
1877	62, 679, 916	1886	93, 297, 290	1894	164, 610, 394
1878	73, 385, 451	1887	96, 123, 586	1895	169, 180, 249
1879	74, 383, 495	1888	108, 827, 606	1896	166, 476, 796
1880	74, 795, 273				

Professor Lexis says:

As great an expert and zealous defender of silver as Suess expressed the opinion in 1892 that the enormous figure which the production of silver had then reached

would not only be maintained, but would rise still higher. What St. Clair-Duport said over fifty years ago, that the silver production of America would find no other limit than that set to it by the ever progressive decline of the value of the metal, has been confirmed by Suess, as it was previously by Humboldt.

Suess maintains that the price of silver has not yet reached its limit. The mines which supply the largest part of the silver have a cost of production of 20 to 24 pence per ounce, and could therefore be very profitably operated while the price was much above that figure. The mines which previous to the present year were compelled to cease operations on account of the decline of prices contributed, as a rule, only little to the total output. "All hope of an improvement in the monetary condition of nations by a lessening of the production of silver," says Suess, "presupposes a very large decline in the price of silver."

The cause of the enormous development of silver production, continues Professor Lexis, lies not only in the continuous discovery and opening up of new veins, but also in the progress made in metallurgy, by which the cost of the production of silver is largely decreased. Dry ores, especially in Colorado, Idaho, etc.—that is, the sulphides of silver found in the deep zone—are no longer treated as they were formerly by the expensive amalgamation process, but are melted, as they had long been in Germany, in reverberatory furnaces with fluxes of silver ores rich in lead, especially carbonates. Mexico is very rich both in dry ores and in fluxing ores. Its productive capacity is almost unlimited, and in the end it is a matter of indifference whether its ores are exported or smelted in the country itself. Modern facilities of transportation naturally help turn to account the ores extracted, both in Mexico and South America. The still unexhausted mines of Potosi have very recently been reopened with improved apparatus. In Peru and Bolivia there is vast room for improvement in technics, especially in the mountainous regions, where no fuel is known but the dung of the llama. The production of Broken Hill in Australia will, according to Suess, probably decrease in the near future, as the top of the region will have been exhausted and the sulphides reached. He is of opinion that the future production of silver will be from dry ores, which are found in combination with volcanic rocks in Mexico, Bolivia, and Chile.

The enormous growth of silver production, which as far as can be seen at present will continue at the height it has already reached unless the price of silver falls very much lower than it is at present, is the final and essential cause of the depreciation of that metal.

Writing in 1893, Professor Lexis said:

> The heavy sales of silver by Germany ceased fourteen years ago. The past coinages of the States that stamped 5-franc silver pieces have been more than counterbalanced by the coinages and storage of silver by the United States. And still another cause of the depreciation which the English silver commission of 1876 called attention to, viz, the decrease of the silver exports to India, has not been operative of late years. These facts make it evident that the great cause of the recent depreciation of silver has been its increased production.

Attention should here be called to a calculation made by Paul Leroy-Beaulieu of the market for silver in the years 1889–1893, and to the inferences he draws therefrom.

To the artificial support given silver by the United States, he says, must be added the monetary consumption of that metal in the countries of Central and South America and in some of southern Europe, like Spain, and the heavy exports of silver to the extreme East. The exports of silver from London alone to India, China, and the Straits Settlements during the period 1881 to the end of 1893 amounted to $458,308,168.

This enormous sum of $458,308,168, absorbed in less than twelve years by the extreme East, was distributed very unequally over the period 1881–1893. It was much larger during the five last years than during the seven first. In 1889, 1890, 1891, 1892, 1893 we reach a total of $222,681,000 for the exports of silver from the port of London to India, China, and the Straits. This represents an average of $44,681,300 for each of these five years. And yet these figures do not seem to represent the total export of silver from eastern countries to those of the extreme East. The statistics of India evidence a much larger import of silver than that shown by the exportation from Great Britain to that country, according to these statistics. While the latter for the years 1889, 1890, 1891, 1892, and the first nine months of 1893 show an export of silver of only 148,165,500 ounces from London to India, and even if we add the year 1888, an export of 169,327,000 ounces for the six years and nine months, the Indian statistics of the net imports of silver into India show for the last five years only—that is, from the Indian fiscal years 1888–89, 1889–90, 1890–91, 1891–92, 1892–93—the much larger sum of 225,177,000 ounces. The difference is about 40 per cent as compared with the Indian statistics.

This difference may be readily understood, because India draws its silver from other sources than the London market. Thus the United States supplies it directly with considerable amounts.

We are warranted in believing also that the same is the case with respect to China and the Straits Settlements. The figure given above of the exports of silver from London to these countries does not represent all that they have absorbed. The United States, for instance, send directly large sums of silver in coin and bars to China and Japan. It may be remarked that this latter country does not figure in the table of the exports of silver from the port of London. For instance, in the year 1892–93 the United States shipped to Japan $1,859,200 in silver bullion and $627,000 to Hongkong. During this same fiscal year, 1892–93, the United States also shipped $7,809,151 of foreign silver pieces, principally Mexican dollars, to Hongkong, and $2,291,780 in pieces of the same kind to Japan. It is certain that China, Japan, and the Straits Settlements received silver from other countries, either in bars or coin, especially from Russia, which, by suspending the coinage of that metal

in 1876 for home use, maintained it for its trade purposes with China, and also from Australia, in payment of tea and other products.

We may therefore, Mr. Leroy Beaulieu thinks, without risk of exaggeration, to obtain the total amount of silver absorbed by the countries of the extreme East, add 50 per cent to the figures given in the British statistics relative to the exports of silver from the port of London to British India, China, and the Straits Settlements.

As these latter statistics give for the five years 1889, 1890, 1891, 1892, 1893, $222,681,000, by increasing it 50 per cent for the reasons above given we reach the sum of $334,021,000 in round numbers, as representing approximately the absorption of silver by the extreme East in the five-year period 1889–1893, an average of $66,805,000 a year.

If now we recall that during the period that the Sherman Act was in force, that is, from July 14, 1890, to November 1, 1893, the United States Treasury purchased and stored in its vaults an average of $65,000,000 a year, we obtain an annual average of $131,800,000 absorbed annually by the extreme East and by the United States Treasury.

But this enormous absorption has not prevented or did not prevent silver from declining in value to the extent of 25 per cent before the suspension of the coinage of silver in India or the repeal of the purchasing clause of the Sherman Act. It is true that the average annual production of silver in 1892–93 exceeded a coining value of $200,000,000; but it must be remembered on the other hand that there will always continue to be a coinage of silver in countries other than the extreme East and the United States. It would be difficult to estimate the amount of this coinage, because frequently the coinage of silver pieces represents, at least in part, old coinages melted down. The world's coinage of silver in 1888 was estimated at $135,000,000; in 1889 at $138,500,000, and in 1890 at $149,500,000. Two-thirds at least, however, of this enormous quantity of new silver coin represent the coinage of the United States, India, Japan, and Hongkong—consumptions of silver which have already been included in the calculations made above of the absorption of the metal of the United States and the extreme East. Another considerable fraction of this silver coinage of the world, to wit, $26,658,000 in 1888, $25,294,000 in 1889, and $24,081,000 in 1890, consisted of the coinage of Mexico, represented by the Mexican dollars, which are current in the entire East. It therefore, in part at least, figured in the preceding calculations.

There remains, however, from $10,000,000 to $15,000,000 after all deductions have been made to represent the annual coinage of silver which remains in the various countries of America and Southern Europe. Thus Peru coined $3,258,000 of silver in 1888, $2,842,531 in 1889, $2,842,530 in 1890; Bolivia $1,762,000 in 1888; Spain $4,436,000 in 1888, $4,710,000 in 1889, $1,479,000 in 1890; Portugal $1,533,000 in 1888, $680,000 in 1889, and $540,000 in 1890; Colombia, Venezuela, Brazil, Ecuador, Costa Rica, and Haiti minted small amounts in this

coinage of silver. Some great European countries also figured in it for rather large amounts—Austria-Hungary for $5,516,000 in 1888, $4,528,000 in 1889, and $3,857,000 in 1890; England for $3,681,000, $10,827,000, and $8,332,000 in these three years, respectively. While admitting that in these States their coinages were really recoinages, there can be no doubt that they also employed to restore the legal weight of the pieces a certain amount of new silver.

The amount of silver estimated to have been employed in coinage in countries other than the United States in the extreme East in the years previous to the closing of the Indian mints averages only about $10,000,000 a year. But we saw above that the United States Treasury and the countries of the extreme East absorbed during the period that the Sherman Act was in force about $131,000,000, to which, if $10,000,000 be added, we have a total absorption of silver per annum of $141,000,000.

Now, asks Paul Leroy Beaulieu, how does it happen that having, by these purchases of the United States Treasury and these exports to the East, as well as by coinage in American and European countries, an outlet of more than $140,000,000 a year in the period 1890–1893, silver fell in value from 15 to 18 per cent or thereabouts—that is, from 47¾ pence per ounce standard in 1890 to 41 in 1893, before the closing of the Indian mints and before the repeal of the purchasing clause of the Sherman Act, while the actual average production of the metal during these years did not exceed $200,000,000 coining value? The answer, Leroy Beaulieu contends, is that silver, having no longer any great employment in industry, "having come to be looked upon by the populations of the West as distinguished from the East as no longer a metal of luxury, and being no longer a precious metal, as a commodity its commercial consumption, at least in Europe and America, is very limited and does not increase."

Leroy Beaulieu, indeed, contends that a metal can be considered a precious metal only so long as it is eagerly sought after for decorating and ornamental purposes, and that it can not serve as money, in the full meaning of the word, when, apart from its monetary function, it does not continue to be extensively employed and to command a high price as a commodity, especially as an object of ornament, decoration, and art. When it has lost this position in the unconstrained judgment of the public, he claims that it has been dethroned as a precious metal and can be used only for token coin as a representative sign; that, consequently, silver being a metal socially fallen, it can serve a monetary purpose, in the full meaning of the words, only in the countries of the extreme East and in other poor countries where it is still sought after as a commodity, as an object of personal display, for ornamentation and decoration.

The increased production of both gold and silver in the world in recent years, and the increasing disinclination of civilized countries

to employ the latter as a monetary medium, necessarily found expression in the visible stocks of the two metals; that is, in the stocks accumulated in the great banks of the world as distinguished from the amounts in the hands of private individuals, in circulation outside of the banks, or hoarded.

Mr. Ottomar Haupt, of Paris, the distinguished French statistician of the precious metals and of their monetary employment, made a careful estimate of these visible stocks at the end of June, 1897, and the results he reached are here reproduced. Mr. Haupt's estimates are given in francs, which have been converted into dollars in the table here presented at the rate of 5 francs to the dollar.

VISIBLE STOCK OF THE PRECIOUS METALS AT THE END OF JUNE 30, 1897.

[Compiled by Ottomar Haupt, of Paris.]

Name of banks.	Gold.	Silver.
Bank of England	$182,600,000	$1,000,000
Other English banks	40,000,000	.....
Banks of Scotland	26,000,000	3,600,000
Banks of Ireland	13,000,000	2,200,000
Bank of France	403,000,000	251,200,000
German Imperial Bank	148,400,000	68,000,000
German banks of issue	24,600,000	1,000,000
German war fund	30,000,000	.....
Austro-Hungarian Bank	151,800,000	53,200,000
Austro-Hungarian treasury	81,000,000	.....
Bank of Italy	60,200,000	11,800,000
Bank of Naples	21,200,000	2,200,000
Bank of Sicily	7,000,000	400,000
Italian treasury	17,400,000	2,200,000
Belgian National Bank	17,600,000	2,400,000
Greek National Bank	400,000	.....
Roumanian National Bank	11,800,000	800,000
Bank of Spain	44,600,000	54,400,000
Bank of Holland	13,200,000	35,600,000
Bank of Algeria	4,400,000	4,200,000
Bank of Portugal	5,400,000	9,600,000
Bank of Sweden	6,600,000	800,000
Bank of Norway	8,600,000	.....
Bank of Denmark	18,800,000	.....
Bulgarian National Bank	1,000,000	1,000,000
Servian National Bank	1,400,000	1,000,000
Bank of Finland	4,200,000	600,000
Swedish banks of issue	2,200,000	2,400,000
Swiss banks of issue	17,800,000	1,800,000
Russian Bank of the State	474,200,000	16,000,000
Russian treasury	103,200,000	.....
Associated banks of New York	94,000,000	.....
United States national banks	85,200,000	13,600,000
United States Treasury	196,600,000	537,600,000
Australian banks	100,000,000	.....
Bank of Japan	43,200,000	21,800,000
Total	2,460,000,000	1,100,400,000

METALLIC STOCKS OF THE PRINCIPAL BANKS OF THE WORLD, FROM 1890 UP TO JUNE 30, 1897.

Year.	Gold.	Silver.
At the end of—		
1890	$1,565,400,000	$850,000,000
1891	1,729,600,000	931,200,000
1892	1,852,800,000	991,200,000
1893	1,964,600,000	1,031,000,000
1894	2,115,800,000	1,061,800,000
1895	2,210,000,000	1,040,000,000
1896	2,317,200,000	1,050,400,000
June, 1897	2,460,000,000	1,100,400,000

It appears from this last table that the world's visible stock of gold increased from 1890 to the middle of 1897—that is, in seven and a half years—156½ per cent, while that of silver remained almost stationary during the last four and a half years, and there is no likelihood that it will increase in the near future, no additional full legal tender silver pieces coming from the mints of the countries in which the great banks of the world are located.

Owing to the vast production of silver in recent years, the violent fluctuations in its value since 1871, never remaining the same in any two consecutive years, and to its unheard of depreciation in a short time, silver can no longer constitute a measure of value, having no stability of value itself. How, indeed, could silver be made to serve as a safe measure of value of all other commodities under the present conditions of its production and its ever declining price in the markets of the world? How can it be safely used as full legal tender money?

"A measure," says L. Wolowski, "which shall be at the same time an equivalent, will always be necessary; it will always be necessary that that measure shall remain equal to itself and be everywhere accepted; that it may be preserved without cost or loss, circulate easily, and be divisible into fractions which may be reunited at will, and that it shall not be intended for destructive consumption, to the end that the existing stock may be only slightly affected by new production, *for it can not be too frequently repeated that the fundamental condition of the measure of value* is its *stability during the periods covering the habitual transactions among men.*

"The Romans, that admirable people, of whom Leibnitz says that they had traced, as it were, the geometry of law, understood wonderfully well the function of money. I shall take the liberty of quoting the Digest. The text of Paulus determines with an exactness which neither Adam Smith nor J. B. Say have surpassed the character of money and the part played by it. I here give that admirable passage (Digest, Book XVIII, Title L, 1): 'Sale begins by exchange; in olden times there was no money, and nothing distinguished *commodities* from

prices, and every man, according to the necessity of the times and of things, bartered that which was useless to him for that which might afford him some utility; for we most frequently see that that which one man possesses another man entirely lacks. Then, as it did not always nor easily happen that one man possessed what another desired, and vice versa, a material was chosen whose public and durable certified value allowed it to obviate the ordinary difficulties of exchange by the identity of its valuations; this material invested with an official imprint no longer bears the name of a *commodity, but of price.*' It seems that there was never anything more precise, more exact, or more complete.

"Money is the *price* of things; it is therefore the soul of all contracts.

"*Money* should be as invariable as possible, in order that human interests may meet a measure susceptible of being prolonged through time and space.

"Money, the instrument of exchange, should have a value in and of itself, because value can be measured only by value. We here find nothing absolute, nothing eternal, as we do in the measure of extent, weight, volume, etc. The meter, kilogram, and the hectoliter do not vary; the measure of value constituting a substance, being something material, something concrete, must necessarily, like all things here below, be subject to the defect of a certain variability.

"I have endeavored to show how the special qualities that distinguish the precious metals have made of them the best measure of value that can be obtained. There is only one inconvenience by which the precious metals will always be affected, and which will never be entirely removed, i. e., that which results from the changes in their amount relatively to the extent of the services which they are intended to perform. Although we cannot here obtain absolute stability, the natural movement of the production of the metals adapts itself to the wants of circulation with sufficient flexibility to prevent a brusque variation of prices and, consequently, to give engagements, speculations, contracts, and conventions of every description a regularity conformable to the principles of justice and equity.

"I thought it incumbent on me to begin by showing the importance of the part played by money and what the functions are which it performs in civilized society where *sale* has taken the place of *barter*, and where consequently the price of all products and the compass of all conventions are expressed in money. Whatever strengthens money, whatever deteriorates it, rises immediately to the height of a question of real interest, which dominates particular solutions. The good faith of contracts, the security of trade, the relations between men of the same state and those that bind together those of different states, the condition of credit, even the development of that powerful engine of modern society—the industry of the laboring classes, the growth of industry—everything, in a word, depends on the sincerity, the fidelity,

the regularity of the action of money, the universal equivalent, of the powerful instrument of the relations of production and exchange which we meet with in specie. Provided that we never lose sight of this luminous beacon we shall escape all peril."

Has silver, at the present day, this sincerity, this fidelity or regularity? Is it an equivalent at all for a month or a year? Does it fulfill the fundamental condition of the measure of value—stability during the ordinary average life of important contracts?

Perhaps the most serious charge laid at the door of the gold standard is that its all but universal adoption by the leading nations has resulted in a great appreciation of its value and in a consequent decline of general prices since 1871. Those who believe in the truth of this charge will do well to weigh the following words of Professor Lexis:

I have mentioned a series of evils which, I admit, are in some way connected with the exclusion of silver from the mints of the great civilized States, since that exclusion is one of the principal causes of the decline in value of that metal. I hope that these evils will be remedied by the natural development of the world's economy; but so-called bimetallism—that is, the international double standard—I can not recommend as such a remedy. When the bimetallists lay still further charges against the gold standard I, for my part, must contradict them. They want to cast upon the gold standard the blame for the general economic depression, which doubtless still prevails, notwithstanding the fact that in 1890 speculation had apparently improved the situation. The great decline of prices in nearly all commodities in wholesale trade, the bimetallists claim, was not produced by overproduction, by the cheapening of the cost of production and transportation, not by the competition of countries newly opened up and with an excess of virgin soil, but by an intrinsic rise of the value of gold itself. Gold, they tell us, can not, without a great rise in its value, perform alone the same task as was formerly performed by gold and silver. They tell us that the enhanced value of gold is reflected in the lower price of commodities.

But it can not be truthfully claimed that thus far gold alone has performed the function of money. With the exception of England, all States in which accounts are kept in gold have still large quantities of legal-tender silver coins in circulation. Germany has at least 400,000,000 marks in silver thalers, France and other States of the Latin Union about 3,000,000,000 in 5-franc silver pieces. Holland has kept all its legal-tender silver, notwithstanding its introduction of the gold valuation; and so also Austria-Hungary. Spain coined from 1876 to 1892 640,000,000 francs in 5-peseta pieces. But above all, the United States in the years 1878 to 1890 coined the enormous sum of $416,000,000 in accordance with the Bland bill, and in addition to this, from 1890 to 1893, it issued under the Sherman Act $155,931,000 in Treasury notes, which are covered by the silver purchased therewith, which is equivalent to an additional silver coinage of that amount.

When we further recollect that in India the coinage of silver was entirely unlimited up to June 26, 1893, and that there was there coined annually at the old ratio of value silver to the amount of 130,000,000 to 140,000,000 marks, and that at present that metal may find employment in China to any amount as money material, it becomes clear that the monetary function of silver was indeed geographically limited by Germany's monetary reform and by the suspension of the coinage of full legal-tender silver pieces in France and other European States, but was not by any means abolished. On the contrary, it is statistically demonstrable that in no former period was there annually coined so much silver money as in the twenty years fol-

lowing the German monetary reform of 1873. Only after the closing of the Indian mints in June, 1893, and the repeal of the Sherman Act in the United States in November of the same year, can it be claimed that there was any demonetization of silver, and even then the demonetization was not complete. But the measures just referred to, which caused the decline of the price of silver from 38d. to 27d., had no influence worth mentioning on the economic depression which had existed before they were passed.

In the United States there raged in the summer of 1893 a crisis, the after effects of which continued in 1894 and 1895, and the Sherman Act was repealed because it was made responsible for the bad condition of affairs. There is a question which, with respect to the United States, I have repeatedly directed to the defenders of the view that there has been an intrinsic appreciation of money, but which has never yet been answered. It is this: How has it been possible that the United States, which from 1878 to 1893 issued or coined more silver money or silver-covered notes than all European States had issued in a period of equal length before 1873, and more than it could have coined under a universal bimetallic system, since then the remaining States would have received a greater share of the silver—how has it been possible that the United States which, besides, produced itself 140,000,000 to 150,000,000 marks of gold and coined a correspondingly large amount of gold, which, besides, had maintained in circulation and as legal tender $346,000,000 in greenbacks—how has it been possible that it, with its de facto double standard, its excess of media of circulation, suffered as great or perhaps greater economic business depression than that alleged to have been caused in Europe by the gold standard, and that the prices of commodities in the United States, notwithstanding the isolation of its market by the Chinese wall of a protective tariff, have always trodden the same downward path as that trod by Europe?

Is it not plain that a movement of prices which shows the same course in two regions with such entirely different currency conditions must have other causes than the demonetization of silver, which took place in the United States only in November, 1893, but which does not prevent it from having $567,000,000 in silver credit-money in circulation at its full nominal value?

There can scarcely be a fitter conclusion to this article than the following résumé by the same eminent German professor of the principal points in the question of the standard made before the Pesth Agricultural Congress of September, 1896.

(1) *The depreciation of silver.*—Its cause lies, on the one hand, in the enormous increase of the production of that metal, and on the other in the national psychologic fact—a very real and universal one that makes itself felt everywhere—that, in the present state of economic development, the countries most advanced in civilization, especially France, consider silver a less fit medium of circulation than gold. There was no real demonetization of silver before November 1, 1893, when the Sherman Act was repealed in the United States, for in the twenty years preceding that date there was more silver coined or used as a covering for notes than ever before in a period of equal length.

(2) *The appreciation of gold.*—The supply and the production of gold has doubled within the last ten years, while the demand for and employment of it, in wholesale trade, has been more and more decreased by the clearing-house system. The great central banks have a gold stock larger than was ever before believed possible; the rate of discount in recent years has been so low as to point to anything rather than to a scarcity of gold. Although the production of gold has been vastly increased, the steady fall of the price of commodities has not been arrested thereby. *This fact is the best refutation that can be given of the bimetallic contention that there is a connection between the quantity of gold and the height of prices. The change of the ratio of the*

value between the two metals can therefore have been caused solely by the fall in the value of silver, and not at all by the rise in the intrinsic value of gold.

(3) *The price of wheat.*—As there has been no scarcity of and no rise in the value of gold, neither the scarcity nor the appreciation of that metal can account for the decline of prices. *The fall of prices of the various kinds of commodities has not been uniform, and hence must have been produced by very different causes; but the gold standard is not one of those causes.*

The same may be said of the general economic condition of the various countries of the world, especially those having the gold standard. If the cause of the deterioration of that condition was to be sought for in the value of gold, the economic crisis caused by the decline of prices would necessarily have effected trade and industry most and not agriculture only. The only thing that can be here taken into consideration is the promotion of the export of wheat from India produced by the difference of exchange. But this export has declined from year to year, notwithstanding this promotion, inasmuch as the Indian mint was closed in 1893 and, as a consequence, the premium on exports, which was never very large, declined.

Lastly, if notwithstanding the national psychologic facts referred to above and other well-known obstacles, a bimetallic union should ever be formed and a rise of nominal prices take place, the gain to agriculture would be small.

* * * * * * *

If the United States were so unwise as to introduce the free coinage of silver, independently of all other nations, it would go through such frightful and deterrent experiences that all other States would probably entirely lose the inclination to engage in similar international experiments.

Is the third point above mentioned well taken? Professor Lexis insists that the contention that the low level of prices of commodities is a consequence of the scarcity of gold, should now be abandoned, since the facts in the case refute it in every particular. Indeed, this refutation would be completed by a mere reference to the fact that in the very years 1886–1897, when the production of gold was largely increased, the level of prices, as is shown by the index numbers of the London Economist and of Mr. Sauerbeck, continued to decline further until the end of June, 1897, when they reached the lowest level ever theretofore attained.

The world's production of gold and the index numbers of the Economist (the figure 2,200 representing the average prices of twenty-two commodities in the years 1845–1850) on the first day of each year for the years 1886 to June, 1897, was as follows:

Year.	World's production of gold.	Index numbers.	Year.	World's production of gold.	Index numbers.
1886	$106,163,900	2023	1892	$146,651,500	2133
1887	105,774,900	2059	1893	157,494,800	2120
1888	110,196,900	2230	1894	181,175,600	2082
1889	123,489,200	2161	1895	199,304,100	1923
1890	118,848,700	2259	1896	202,956,000	1947
1891	130,650,000	2224	1897 (end of June)	.....	1885

It will be noticed from the above table that from 1886 to 1896, both years included, the prices of commodities declined, while the production of gold annually increased.

At the end of June, 1897, we find the minimum of these characteristic numbers, namely, 1885. In April, 1895, we find the minimum of the index numbers of that year and the minimum for a number of years previous, indeed ever since 1886. After that there occurred a slight rise, and the index number reached 2009 on the 1st of October. But that this price movement had no connection with the intrinsic value of gold is undoubtedly proved by the facts. Precisely in this period of the ascending price movement we find in the great European banks the enormous increase of gold stocks, the chronic overcovering of notes in the Bank of England and the German Imperial Bank already referred to, and in consequence thereof a diminution rather than an increase of the total amount of metallic money and bank notes.

Moreover, this same price movement manifested itself not only in Europe but also in the United States, although the latter country had parted with large sums of gold in 1894, as it had in the previous year (nearly $88,000,000), and although the exports of gold in the year 1895 exceeded the imports. Lastly, a closer observation of the changes of prices shows that these changes were very different in the different classes of commodities. The most important agricultural products in the Economist's list of commodities—wheat, flax, tallow, rice—did not rise in price during the period in question. They declined; but the rise took place in industrial raw materials, in metals, and manufactured articles, and it is easy to find for each of these commodities the special causes of their rise in price. (Lexis.)

The connection between the quantity of money and the formation of the price of commodities is never a direct one, never mechanical, so to speak, but, as already remarked, is always produced more or less indirectly and in a more or less roundabout way, and can be reduced to no fixed quantitative rules. A direct influence on prices is exercised only by an increased demand for commodities; which proceeds from the new production region after the discovery of rich gold beds, but which, as is shown by the contrast between the Transvaal and California and Australia, appears in very different forms and with a very different capacity to influence prices. Local prices, as formed in the production regions, are, of course, not decisive even when they remain unusually high for a long time. But in the markets of the world the increased demand represented by the new gold produced will soon be met by an increased supply of commodities, and this will, in so far as the cost of production has not risen, bring prices back again to their former level. But an increase in the cost of production can be expected only in case of goods which, under the same conditions, can not be produced in any desirable quantity; among which, under present economic conditions, there are now only some articles of luxury. But, under certain circumstances at least, human labor would have to be ranked among them.

However, the amount of labor withdrawn from other branches of production by the working of new gold mines is evanescently small as com-

pared with the laboring population of the entire civilized world. But, above all, the more active demand for commodities operates continually as an incentive to the further improvement of technic processes and of the means of transportation, by which the demand for labor for the production of the same amount of commodities is diminished. There may be even an increase of the quantity of money as a consequence of gold discoveries which, after local and transitory changes of prices, ultimately leaves the general level of prices unchanged, because, as a result of the increasing productiveness of labor, an increase of the amount of commodities takes place, which offsets the increased demand and insures to the increased quantity of money a corresponding increased employment. (Lexis.)

The value of money depends greatly upon the amount of exchanges, expressed in terms of money, made in a given period of time—a year for instance; but it must be borne in mind that in countries whose national economy is a highly developed one, only a small part of these exchanges is effected with the cooperation of specie, while the greater part is effected by other media of circulation for which a suitable quota of specie must be kept on hand as a security fund. If this specie covering, in consequence of new accessions of gold from the mines, increases, the disposable free purchasing power of the monetary media, in the form of bank notes and of bank deposits, always payable on demand, may increase many times this additional amount, without the security of these media of circulation becoming impaired. But it becomes all the more possible that when there is a large increase in the production of gold the total of the media of circulation may increase faster than the total exchanges of commodities in a given period, which then may produce a general rise of the nominal prices of all commodities and of all articles of trade. But whether this shall really happen depends upon the state and propects of disposable private capital, which appears in very many forms and which is always expressed in money.

The demand for commodities caused by the accumulation of newly produced gold can cause only a transitory movement of the market, unless it constitutes the starting point of a progressive wave of production and consumption. But if it leads to a precipitation of idle capital in search of employment its effect on the formation of prices ceases. This is shown by the course thus far of the gold production of the Transvaal, a production which has contributed only to increase private money capital—that is, the amount of free purchasing power destined for purposes of acquisition without the favorable opportunities for investment being increased. (Lexis.)

On the other hand, the first accessions of gold from California and Australia occurred at a time in which European and American industry was acquiring for the first time the greatest part of its modern equipment; when many of the most important and profitable railways were

building; when the banking system on the continent of Europe was entering on its modern development; and when, in general, the real conditions precedent to an economic revolution existed—conditions which are always found combined with the upward movement of prices. But this movement was now supported by the large acquisitions of new gold, which hindered the general level of prices to be again depressed to its former level after the crisis which could not fail to occur on account of the wild speculation then prevailing, and which actually occurred in 1857. The increase of the quantity of money, therefore, can never, independently and of its own force, produce a general rise of prices; it can operate only in connection with the briskness of trade, based upon world-economic conditions of production and exchange, and then it operates chiefly by allowing a further expansion of the credit system.

But the most recent growth of the world's gold production does not coincide by any means with world-economic conditions as favorable as those that existed at the beginning of the fifties. It has hitherto remained without effect, because it has served mainly only to increase the monetary capital that was unemployed or used only in unprofitable exchanges. Moreover, its influence, if it should make itself felt, after a beginning of more favorable contingencies, would be even less intensive than that of the Californian and Australian gold in its earliest period, because the great amount of gold now produced, although absolutely greater than it was then, is of smaller importance, as compared with the total gold existing in the world, than was the gold production of the world in the early days of California and Australia. (Lexis.)

From the above considerations it follows that bimetallism, if it should succeed in restoring and fixing definitively the old value of silver, would not be able by its own unaided power to produce a rise of prices. If during the past year there had been coined in Germany, England, France, and the United States $100,000,000 in legal-tender silver pieces, in addition to the gold coined in these countries, such coinage would have caused only a still greater accumulation of metallic money in the vaults of their banks; but general economic conditions would not have been changed thereby. Agriculture would have reaped no advantage therefrom, for the actual conditions of competition in the world's market would not have been changed, the natural superiority of transoceanic countries over Europe, burdened as it is with land rents and taxes, would have remained the same, and there would have been no change worth mentioning in the condition of the standard or in valuations, for the United States has no depreciated currency, Argentina has not the silver standard, but paper money, and the same might have been said of Russia until the issuance of the ukase of January 15, 1897.

India's share in the export of wheat to Europe has declined so greatly that a still further diminution of its competition by the restoration of the old value of silver would exercise as little influence on the market price in Europe as the decline of India's exports of wheat to Europe,

which fell from 30,300,000 hundredweight in the year 1891-92 to 12,200,000 hundredweight in the year 1893-94. On the other hand, a general rise of prices produced by the favorable conditions of production and consumption would assume dimensions dangerous to all interests, unless the expansion of credit therewith connected were based not only on the already enormous stock of gold, but also on a stock of silver colossal in its dimensions and capable of being even more rapidly increased than the stock of gold; and even the normal height of the level of prices produced in the period of overspeculation would not be determined by the actual conditions of production and consumption, but would rest to a great extent merely on an intrinsic depreciation of money wherewith, apart from the injury done to many private interests, there would be connected the economic disadvantage that twice as much precious metal would be necessary in order to set in motion the same mass of commodities in trade, because all exchanges would be made at higher nominal prices; but the original ascending movement could proceed only from the industries which should obtain support from the banks. Hence the profits made would go to industrial and commercial capital. But agriculture would, on account of the departure of agricultural laborers to the cities and of the raising of money wages, suffer, while its most important products would be the last to feel the rise of prices and would gain, relatively speaking, nothing, but be in a worse condition than previously, for the reason that the wages of labor and the other items of the cost of production would rise in a higher proportion. It would, therefore, not be certain that the indebted landholders, after the new formation of prices, which would, of course, leave transoceanic competition its relative superiority, would find it easier to meet the interest on their obligations and to pay their debts. The new debts would naturally adjust themselves from the first to the new level of prices.

The hypothesis above assumed, that silver in the bimetallic system would regain its old value as compared with gold, maintain that value steadily, and operate side by side with gold as an equal medium, would not be verified by a bimetallic experiment, but gold would reach a premium and be accumulated in the banks, while silver would, in a short time, as in France up to 1848, constitute the only money to be found in trade. Then, indeed, a rise of the prices of commodities without the cooperation of a business "boom" would take place in consequence of the diminished intrinsic value of the money represented by silver, while prices calculated in gold—the premium on that metal being taken into consideration—might remain at their former level.

Mortgage creditors, however, would not take account of this diminution of the value of the medium of payment without a struggle, and if the law should deprive them of the possibility of demanding back in gold the sums they had loaned in gold, we should expect to see both before and immediately after the introduction of the new coinage system a foreclosure of mortgages on an immense scale and an agricultural credit crisis from which the debtor landowning class would certainly suffer most.

The following table shows the production of the precious metals in the world for the calendar years 1860–1896:

PRODUCT OF GOLD AND SILVER IN THE WORLD, 1860–1896.

[The annual production of 1860 to 1872 is obtained from 5-year period estimates, compiled by Dr. Adolph Soetbeer. Since 1872 the estimates are those of the Bureau of the Mint.]

Calendar year.	Gold.		Silver.		
	Fine ounces.	Value.	Fine ounces.	Commercial value.	Coining value.
1860	6,486,262	$134,083,000	29,095,428	$39,337,000	$37,618,000
1861	5,949,582	122,989,000	35,401,972	46,191,000	45,772,000
1862	5,949,582	122,989,000	35,401,972	47,651,000	45,772,000
1863	5,949,582	122,989,000	35,401,972	47,616,000	45,772,000
1864	5,949,582	122,989,000	35,401,972	47,616,000	45,772,000
1865	5,949,582	122,989,000	35,401,972	47,368,000	45,772,000
1866	6,270,086	129,614,000	43,051,583	57,646,000	55,663,000
1867	6,270,086	129,614,000	43,051,583	57,173,000	55,663,000
1868	6,270,086	129,614,000	43,051,583	57,086,000	55,663,000
1869	6,270,086	129,614,000	43,051,583	57,043,000	55,663,000
1870	6,270,086	129,614,000	43,051,583	57,173,000	55,663,000
1871	5,591,014	115,577,000	63,317,014	83,958,000	81,864,000
1872	5,591,014	115,577,000	65,317,014	83,705,000	81,864,000
Total	78,766,630	1,628,252,000	547,997,231	729,563,000	708,521,000
1873	4,653,675	96,200,000	63,267,187	82,120,800	81,800,000
1874	4,390,031	90,750,000	55,300,781	70,674,400	71,500,000
1875	4,716,563	97,500,000	62,261,719	77,578,100	80,500,000
1876	5,016,488	103,700,000	67,753,125	78,322,600	87,600,000
1877	5,512,196	113,947,200	62,679,916	75,278,600	81,040,700
1878	5,761,114	119,092,800	73,385,451	84,540,000	94,882,200
1879	5,262,174	108,778,800	74,383,495	83,532,700	96,172,600
1880	5,148,880	106,436,800	74,795,273	85,640,600	96,705,000
1881	4,983,742	103,023,100	79,020,872	89,925,700	102,168,400
1882	4,934,086	101,996,600	86,472,091	98,232,300	111,802,300
1883	4,614,588	95,392,000	89,175,023	98,984,300	115,297,000
1884	4,921,169	101,729,600	81,567,801	90,785,000	105,461,400
1885	5,245,572	108,435,600	91,609,959	97,518,800	118,445,200
1886	5,135,679	106,163,900	93,297,290	92,793,500	120,626,800
1887	5,116,861	105,774,900	96,123,586	94,031,000	124,281,000
1888	5,330,775	110,196,900	108,827,606	102,185,900	140,706,400
1889	5,973,790	123,489,200	120,213,611	112,414,100	155,427,700
1890	5,749,306	118,848,700	126,095,062	131,937,000	163,032,000
1891	6,320,194	130,650,000	137,170,919	135,500,200	177,352,300
1892	7,094,266	146,651,500	153,151,762	133,404,400	198,014,400
1893	7,618,811	157,494,800	165,472,621	129,119,900	213,944,400
1894	8,764,362	181,175,600	164,610,394	104,493,000	212,829,600
1895	9,641,337	199,304,100	167,288,729	109,406,800	216,292,500
1896	9,817,991	202,956,000	165,100,887	111,278,000	213,463,700
Total	141,723,650	2,929,688,100	2,459,025,160	2,369,697,700	3,179,345,600
Grand total	220,490,280	4,557,940,100	3,007,022,391	3,099,260,700	3,887,866,600

WORLD'S COINAGE, 1894, 1895, AND 1896.

In the appendix will be found a table, revised from the latest information received, exhibiting the coinages of the various countries of the world during the calendar years 1894, 1895, and 1896. The following is a summary of the same.

COINAGE OF NATIONS.

Calendar year.	Gold.	Silver.
1894	$227,921,032	$113,095,788
1895	231,087,438	121,610,219
1896	195,899,517	153,395,740

The above figures represent, as nearly as this Bureau has been able to ascertain, the total value of the gold and silver coinages executed in the world during the years therein named.

It must be borne in mind, however, that the total of these coinages does not correctly represent the amount of new gold and new silver made into coins during the year, for the reason that the coinages as reported include the value of domestic and foreign coins melted for recoinage, as well as old material, plate, etc., used in coinage.

In the circular letter of inquiry prepared at this Bureau and sent to foreign Governments through the Department of State, asking for information on these subjects, it was especially requested that each country report the amount of such recoinages. This has been done in many instances, but not in all.

The following table exhibits the number of fine ounces and value of gold and silver coinage of the world, by calendar years, from 1873 to 1896:

COINAGE OF GOLD AND SILVER OF THE MINTS OF THE WORLD FOR THE CALENDAR YEARS 1873–1896.

Calendar year.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Coining value.
1873	12,462,890	$257,630,802	101,741,421	$131,544,464
1874	6,568,279	135,778,387	79,610,875	102,931,232
1875	9,480,892	195,987,428	92,747,118	119,915,467
1876	10,309,645	213,119,278	97,899,525	126,577,164
1877	9,753,196	201,616,466	88,449,796	114,359,332
1878	9,113,202	188,386,611	124,671,870	161,191,913
1879	4,390,167	90,752,811	81,124,555	104,888,313
1880	7,242,951	149,725,081	65,442,074	84,611,974
1881	7,111,864	147,015,275	83,539,051	108,010,086
1882	4,822,851	99,697,170	85,685,996	110,785,934
1883	5,071,882	104,845,114	84,541,904	109,306,705
1884	4,810,061	99,432,795	74,120,127	95,832,084
1885	4,632,273	95,757,582	98,044,475	126,764,574
1886	4,578,310	94,642,070	96,566,844	124,854,101
1887	6,046,510	124,992,465	126,388,502	163,411,397
1888	6,522,346	134,828,855	104,354,000	134,922,344
1889	8,170,611	168,901,519	107,788,256	139,362,595
1890	7,219,725	149,244,965	117,789,228	152,293,144
1891	5,782,463	119,534,122	106,962,049	138,294,367
1892	8,343,387	172,473,124	120,282,947	155,517,347
1893	11,243,342	232,420,517	106,697,783	137,952,690
1894	11,025,680	227,921,032	87,472,523	113,095,788
1895	11,178,855	231,087,438	94,057,903	121,610,219
1896	9,476,620	195,899,517	118,642,018	153,395,740
Total	185,358,002	3,831,690,424	2,344,620,840	3,031,428,974

REPORTS OF THE SPECIAL AGENTS OF THE BUREAU OF THE MINT ON THE PRODUCTION OF THE PRECIOUS METALS IN 1896 IN THE SEVERAL STATES AND TERRITORIES.

I.

ALASKA.

By Charles G. Yale.

According to returns received at the United States mint at San Francisco, Cal., the bullion yield of Alaska for the year 1896 was as follows:

Gold	$2,861,306.61
Silver	45,798.72
Total	2,907,105.33

The output of 1895 was—

Gold	$2,328,419.43
Silver	97,862.53
Total	2,426,281.96

This shows an increase in gold product over 1895 of $532,887.18; a decrease of silver product of $52,063.81; and a total increase of bullion product of $480,823.37.

It is proper to note that this increase in bullion product for the year is much less than the amount estimated by Alaskan newspapers. They estimate the output of the Yukon River camps as $2,100,000 alone, without considering other sections of the Territory. Their estimates of the yield of the large quartz-mining companies are also much higher than the actual returns sent to the mint by said companies.

It is admitted that it is very difficult to obtain exact returns except from the regularly organized mining companies; and nearly all the placer mining is done by individuals or small companies, from whom it is almost impossible to obtain returns. The conditions of mining in Alaska differ little, if any, from those described in the last Report of the Director of the Mint; nor has there been much, if any, change in the districts. Circle City is now the mining center of the Yukon River region, and Forty Mile is in a state of decadence, the richer grounds being nearer the former place. The placers near Circle City are at Birch, Deadwood, Greenhorn, Independence, Mastodon, and Eagle creeks.

The richest diggings yet discovered were found in the fall of 1896 at Klondike Creek and its tributaries, supposed to be in British territory. There are no roads or trails in the country, and the miners pack their supplies on their backs in summer or haul them on sleds in the winter. The gold-bearing gravel in that region is frozen into a solid, compact

mass, rendering it difficult to work, but by the "burning" method now adopted the mining season has been considerably lengthened, and more or less work is carried on all winter. As the method is unique, a description from the Alaska News will be of interest:

Various ways were tried by the miners of ten years ago to expedite the slow work of the sun in thawing out the congealed mass. Picks were found to be of no avail, as the heaviest blow would produce but little more impression than it would have done on a solid block of granite.

Dynamite was experimented with, but a heavy shot resulted in blowing out only a "pot hole" and had no effect whatever in loosening the surrounding gravel. Hydraulics were proven equally futile, the stream from the giants serving only to bore a hole in the bank against which it was directed. In fact, the only manner by which the shallow, or summer diggings, could be worked at all, was to strip or burn off the heavy coating of moss covering the earth, thus allowing the sun to reach the gravel beneath. This in a day would thaw to a depth of 3 or 4 inches and that amount could be shoveled into the sluices, and another like amount would be workable the day following. The summers were short, however, and it was an unusual season that would permit of more than ninety days' work at the sluices, and claims that would not pay an ounce to the shovel were abandoned. Then came the discovery of the Birch Creek mines, and the problem of profitably operating the mines in the winter time solved itself as a simple matter of necessity. With the pay streak located from 15 to 25 feet beneath the surface, it would have been impracticable and almost impossible to remove the barren earth lying above it.

Prospecting was done by burning holes in the gravel. A huge pile of logs would be fired on the spot where it was proposed to sink, and allowed to burn over night. In the morning a foot in depth would be found to have been thawed out, and this was shoveled aside and a fresh fire kindled. By continuing this operation a number of days the shaft would finally reach the pay streak, and then it became a comparatively easy matter to ascertain the probable worth of the claim. If the gravel panned an ounce or two a day, more fires were built at the bottom of the shaft and "drifting" was begun with the pay streak, the latter being followed the same as in a quartz lode. During the night is the time employed to "burn," the fires being heaped up with logs just before the day's work is done. They last all night, and by morning, if the amount of fuel is properly gauged, nothing remains but the dying embers and hot ashes; the smoke and gases have all escaped and the work of shoveling the loosened gravel begins without delay. A windlass has already been erected over the shaft, and as fast as the bucket is filled the contents are hauled to the surface and dumped in a convenient place for washing the following season. When the drift has reached a short distance underground the bitterly cold weather of the winter has no terrors for the placer miner, and he prosecutes his work in comparative ease and comfort. As distance from the shaft is gained, a wooden track is laid on the floor of the tunnel, and a car, pushed by hand, is employed to convey the gold-bearing gravel from the ever-receding breast of the drift to the primitive hoisting works.

The pay streak on Mastodon Creek, which is the principal producer in the Birch Creek section, varies from 3 to 4 feet thick and from 15 to 100 feet wide. In running a drift, a uniform size in the tunnel is maintained of 5 to 5½ feet in height and one cut 16 feet wide, though some have been driven but little over 4 feet high. Several claims have worked out the pay streak for a width of over 40 feet, and so solid is the frozen roof that no timbers or other supports are necessary to hold it up. Indeed, old miners assert that the solid ice and muck above them is much firmer and safer than it would be were the roof of granite.

After a sufficient time has elapsed from the dying out of the log fires, the air underground is pure and wholesome. There is a marked peculiarity about some of

the claims on Mastodon Creek, the cause of which no one has yet ventured an opinion. In many instances the pay streak is found free from ice and the gravel can be taken out with pick and shovel, though Mastodon is the only creek that is known where such conditions exist. It can not be that the gravel in these claims lies below the frost line, as on other creeks in close proximity to Mastodon are shafts double the depth, in which the pay streak is frozen as hard as concrete.

Timbering is necessary in the drifts where no frost is found, roughly hewn logs and often mounds, built of the loose bowlders excavated in the course of burning, being employed as roof supports. In following the pay streak the miner often leaves the channel of the creek as it now exists and finds himself under a bench or, perhaps, a side hill after having proceeded a hundred feet, and it has been found that in prospecting new discoveries the creek bed may be practically barren, yet a shaft sunk on one of the contiguous benches is liable to disclose a streak of great richness.

Who it was that first conceived the idea of drifting under the muck banks and thawing the frozen gravel by means of log fires would be difficult to determine, but whoever he may be, he deserves a monument as a perpetuation of his memory. The ability to mine in the winter has lengthened the mining season from eight to nine months. As soon in the fall as it becomes cold enough to freeze the water and prevent the shaft from filling up, then the winter miner begins his labors only to cease in the spring when the water begins running again. During the cold weather he has hoisted to the surface, and there lies on his dump, many tons of gravel wherein may be a small-sized fortune as a compensation for his work of the winter. Exposed to the sun, the gravel quickly thaws, for it has frozen again after being cast upon the dump, and then it is shoveled into the sluices and the glittering yellow grains of gold are caught by the riffles, finally finding a resting place in the buckskin sack of him who has toiled so unremittingly to wrest them from the gravelly bed provided by nature.

The discoveries of gold on Resurrection and Six Mile creeks, Turnagain Arm and Cook Inlet attracted a great crowd of men in 1896, but the results were not what was expected by most of them. It is estimated that 1,500 to 1,800 men went to that region in 1896, most of whom were totally inexperienced in mining. A late season kept the snow on the ground longer than usual, and few of them were successful in locating paying claims. Some few rich claims were found, but most of the ground was retained in few hands in 20-acre tracts, the best claims having been located before the "rush" came. Not over 200 of these people remained in the country for the winter months. Washing commences in May and ceases about October, after which everything freezes up. Good diggings were found on Canyon Mills, Gulch and Lynx creeks, in Sunrise district, and on Bear and Palmer creeks, in Hope district.

The ruby beach sand claims at Lituya Bay, which lie along the shore line some miles above the entrance to the bay, did very well last season. The gold is fine and scaly, though riffles filled with quicksilver and silver plates are the only gold savers used with the sluices.

The quartz-mining interests of the Territory are yearly growing in importance, as more capital is invested and the claims are suitably equipped with machinery. The most productive sections are on Douglas and Unga islands, particularly the former, where the Alaska-Treadwell and Alaska-Mexican mines are situated. In the whole Territory

during 1896 two new 10-stamp mills were erected and 65 stamps were added to old mills. There are now 549 stamps at work, all but 94 of which run winter as well as summer.

At the Silver Bow Basin, 4 miles from Juneau, there are many producing quartz claims. The Takou group has a 10-stamp mill; the Nowell a 20 stamp, and the Campbell group a 30-stamp mill. In Sheep Creek Basin, where silver predominates in the ores, there is a 15-stamp mill and a number of promising claims. At Sum Dum district, 50 miles south of Juneau, the ores carry no free gold, but are rich in auriferous sulphurets. The Bald Eagle is the principal mine. At Norton Sound, latitude 65° N., the Umalak mine has a 10-stamp mill, where they carry on the most northern quartz milling operations in the world. At Unga Island, south of the Alaska Peninsula, the Apollo Consolidated mine is operating a 40-stamp mill successfully. At Berners Bay, 40 miles north of Juneau, there are extensive works operated by the Berners Bay Mining and Milling Company; and here also is the Julian mine and many other claims of promise. At Funter Bay, on the west side of Admiralty Island, a 10-stamp mill is operated on ores of the Willoughby group. There are other mines on the island only partly developed.

A characteristic of the quartz ledges of Alaska is their great width. There are large bodies of low-grade ore easily mined and milled, rendering the operations quite profitable after a suitable investment has been made for the extensive plants required in such cases. Many new quartz properties are being operated, and considerable capital is being invested in mines and plants.

It is rather difficult to make an approximately correct estimate of the number of miners and prospectors in Alaska for a given period, since the mining population is so nomadic. While the number of men in summer is quite large, comparatively few remain during the long winter. Moreover, in some of the newest placer districts there are great numbers of prospectors, owning no claims, who may stay only one season or part of one. It is impossible to obtain addresses of these men for statistical purposes, nor can they be readily enumerated. In many places there are few actually engaged in mining, while the number of prospectors is large. Returns to inquiries from the Mint Bureau show a total of 2,579 men engaged in quartz and placer mining in the Territory, though if the many prospectors at the Cooks Inlet country were included they would swell the total to 3,849 men. There were 230 men actually engaged in mining in that section, but it is estimated that there were upwards of 1,500 men on the ground during the summer, including those who were mining. The rest of them were attracted to the new region by reports of its great richness, but the larger proportion returned disappointed.

An enumeration of the miners, with rate of wages in different portions of the Territory, shows the following results: Admiralty Island,

there were 34 men working for wages at $3.50 per day; Berners Bay, 80 men at $3.50 per day and board; at Cooks Inlet some get $3.50 and $4 per day and board, and others receive higher wages. Most of the men at this place worked on their own claims. On Douglas Island the miners get $3.50 per day and laborers as low as $2. There are 317 men working for wages on the island. At Lituya Bay there are 58 men at work on beach sands who get $3.50 per day, or $50 per month and board. At Norton Sound there are 10 men at work. In the Silver Bow Basin mines, where there are 135 men, they are paid $2.50 and board, or $3.50 per day. At Sum Dum there are 40 men working for $3.50 per day. On Unga Island, where 125 men are employed, miners are paid an average of $3.25 per day. In the Yukon River region, where it is estimated there were 1,500 men in the summer of 1896, those who worked for wages got $10 per day. Most of the men worked for themselves, however. An estimate of 50 miners is made for those working in a small way in isolated districts.

PRODUCT OF ALASKA, BY DISTRICTS, 1896.

RECAPITULATION.

District.	Gold.	Silver.	Total.
Admiralty, Douglas, and Unga islands	$1,370,861.65	$39,619.88	$1,410,481.53
Berners Bay	160,000.00	.....	160,000.00
Cooks Inlet	120,000.00	.....	120,000.00
Lituya Bay	39,000.00	.....	39,000.00
Norton Sound	15,000.00	.....	15,000.00
Silver Bow Basin	241,273.73	403.38	241,677.11
Sum Dum	90,171.23	5,775.46	95,946.69
Yukon River	800,000.00	.....	800,000.00
Territorial	25,000.00	.....	25,000.00
Total	2,861,306.61	45,798.72	2,907,105.33

If as much trouble and real work had to be resorted to in any other part of the world to recover gold from auriferous gravel deposits as Alaska, there would not be much placer mining. Note the following from the Alaska Mining News:

When gold was first discovered in the Yukon Valley the great drawback in successfully operating the rich placer mines was found to exist in the auriferous gravel being frozen into a solid, compact, adamantine mass, which the rays of the summer's sun could never melt and with which the methods usually employed in washing out gold were totally ineffective. There seemed to be no end to the depth to which the frost penetrated the earth's surface, as the deepest shaft or prospect hole has yet to reach unfrozen gravel, except in certain localities, and in such places no one has been able to account for the strange phenomenon.

II.

ARIZONA.

By JOHN F. BLANDY,
Mining Engineer, Prescott, Ariz.

The returns of the precious metals produced in 1896 for the Territory of Arizona are more satisfactory than for the year previous.

In gold there has been an increase of $815,279, or 43½ per cent, over 1895. A large amount of this has come from Yuma County, where the Fortuna mine, which started September 1, shows a production of $400,000, and is now producing about $100,000 per month. Next to this comes the Congress mine, in Yavapai County, which shows an increase of $100,000 over the previous year. Hardly a mine of any note but has increased its production, and several new ones have been started during the year. As this improvement has not been confined to any one district or county, it is a most promising feature for the future.

The Pearce mine, in Cochise County, has been opened during the year and promises to restore the yield of that county to its former leading position. The ore is gold and silver. Another mine—the Gold Cliff—is now being opened near it and bids fair to be equally productive.

Several mines of note have been started during the year, the most conspicuous being the Mohawk, in Pinal County, and the Planet Saturn, in Yavapai County; also one in the Picacho district of Yuma County. These all promise to materially increase the output for 1897.

Several gold mills are now being erected at various points in the Territory. No change has taken place in the placer fields, although there is a vast territory of placer ground. The large fields can not be worked without a heavy outlay to conduct the water upon them, and it is not likely that this will be done at an early day. The total yield of placer gold in the Territory does not exceed or hardly equal $100,000. This gold is collected by so many persons and in such scattered localities that it would be quite impossible to get at any exact figures.

The yield of silver remains about the same, and comes mostly as a by-product from the gold mines. The Pearce ore being principally silver has added much to the production of Cochise County. But two exclusively silver mines have been worked in Yavapai County, and they are quite small and without mills. The White Hills mines of Mohave County have also been at work and several chloride mines in that

county, all on silver ores. I have not been able to obtain any returns from that county for the year. The producers seem to be indifferent to the question of statistics and have not been willing to make any answers to questions. The yield of the county has probably been nearly equal to that of 1895, when it was gold, $83,600, and silver, 480,275 ounces. I have had the same difficulty with part of Pima County, particularly the Harshaw district.

Production of gold and silver in Arizona for 1896.

Counties.	Gold bullion.	Gold in ores.	Total gold.	Silver bullion.	Silver in ores.	Total silver.
				Ounces.	*Ounces.*	*Ounces.*
Cochise	.....	$180,746	$180,746	.....	778,083	778,083
Gila	$49,250	.....	49,250	.....	.....	.....
Graham	1,172	.....	1,172	.....	.....	.....
Maricopa	58,211	34,035	92,246	13,154	2,398	15,552
Mohave	.....	.....	.....	.....	.....	.....
Pima	152,272	.....	152,272	5,023	.....	5,023
Pinal				.....	.....	.....
Yavapai	350,750	1,228,909	1,579,659	.....	131,389	131,389
Yuma	631,552	.....	631,552	.....	33,466	33,466
Total	1,243,207	1,443,690	2,686,897	18,177	945,336	963,513

	Pounds.
Copper reported	43,334,520
Lead reported	1,026,500

III.

CALIFORNIA.

By Charles G. Yale.

From returns received at the San Francisco mint the following is shown to be the product of gold and silver in the State of California for the calendar year 1896:

Gold	$17,181,562.70
Silver	422,463.60
Total	17,604,026.30

In 1895 the figures obtained from the same sources showed the product to be—

Gold	$15,334,317.69
Silver	599,789.70
Total	15,934,107.39

A comparison of these figures of the respective years shows an increase of gold product in 1896 over 1895 of $1,847,245.01; a decrease in silver product of $177,326.10, and a total increase of precious metal product in the State of $1,669,918.91.

From California the superintendent of the mint at San Francisco reported for the year 1890 a gold product of $12,309,793.08, and in 1891 he reported an increase over that amount of $419,076.70. Then, in 1892, a decrease in gold product of $156,969.21 was shown; and again, in 1893, a still further decrease of $33,120.97 from the previous year's returns. Since that time the annual increase of gold product in California has been regular and with a gaining ratio. In 1894, when the reported gold product of the State was $13,863,281.89, the figures showed an increase over 1893 of $1,324,502.29; the next year showed a further increase of $1,471,035.80, and 1896 shows a gain over 1895 of $1,847,245.01. These figures are for the gold product alone, the larger silver mines, as in other States, making a lessened product of late years. This result has been expected by those familiar with the gold-mining industry of California, in view of the fact that more capital has of late years been invested in the quartz and drift mines, and they have been worked on a large scale in consequence. Deeper mining has been done than ever before, with very satisfactory and profitable results. The success achieved by some of those engaged in deep quartz mining has led others to continue sinking on their own mines. This, too, has caused the reopening of many old mines, which have been for

years idle and which had only been worked to moderate depth. The changed conditions in both mining and milling operations make it profitable to work mines which twenty years or so ago were unprofitable.

There is scarcely a mining county in the State where there are not more or less of these old mines which have been long idle. These are now being pumped out and rehabilitated by companies with sufficient capital to develop and equip them properly. In addition, a great number of prospects or small mines are being developed and brought to a producing stage. There has probably been greater activity throughout the mining districts of the State during the year 1896 than has been the case for many years. Great numbers of mines have been sold or worked under bond, and many new ones have been started up. The activity during the year has been particularly manifest in the Mother Lode section of the State and on the desert regions in the southern portion.

The "excitement" of the year was in a portion of the desert region of Kern County, around Randsburg, Garlock, and Johannesburg. That portion of the county lies in an isolated range to the eastward of Tehachapi and Mohave stations, on the Southern Pacific Railroad. Water is exceedingly scarce and the cost for milling the ore is high. Numerous good quartz claims were found which began to pay from the grass roots, but no extensive developments have yet been made. Large numbers of people went into the new district, most of whom were without mining experience. Some specially rich strikes were made. Generally speaking, the veins are small but rich, though some wide veins of good ore were found. Gradually the prospectors in this section of the State went southward into Inyo and San Bernardino counties, where still further discoveries were made. Being in a desert region, little systematic prospecting had heretofore been done, though the "dry diggings" of Goler, Red Rock, and thereabouts had been worked several years. The desert hills and mountains are now, however, filled with prospectors and miners, and many mines are being worked. Milling facilities are scant by reason of lack of water, but the sources of supply are being developed as the needs of the community demand more water for domestic and milling purposes.

Not only has prospecting been very active in the desert regions to the south, but all over the State, in the older mining sections, which have been settled up since the early days of mining in California. The fact that there has been an opportunity to sell any mines discovered stimulated men to search for claims. Not that there has been any special demand for "prospect," generally speaking, but it has been easier than formerly to get financial assistance to open them, and when developed unto anything of promise capital stood ready to take them. In view of the demand for gold properties, numerous small claims have been worked with the hope of developing them into a suitable proportion to offer to men of means. In the case of larger mines, properly

opened and developed to a producing stage, there has really been more of a demand than supply.

In Siskiyou and Trinity counties, in the northwestern portion of the State, where there are no navigable streams to be injured by mining débris, the hydraulic mining industry has been quite prosperous, and both these counties show a measurable increase of gold product. The hydraulic mines operating in the drainage basin of the Sacramento and San Joaquin rivers have been gradually increasing in number as permits are granted to mine by the California Débris Commission under the Caminetti act. Without this permit such mines may not be worked. Before it is granted suitable impounding or restraining works to hold back the débris from the stream must be constructed, and these must be of a character satisfactory to the commission. Some few of the mines which were granted permits have been stopped again owing to the inadequacy of the restraining dams or works. Many others have been given licenses. None of them can work on so large a scale as when they were permitted to do so unrestrictedly, as the material behind the restraining dams must be allowed to settle so that too large a proportion of mud, sand, etc., may not escape with the water. All of these matters are looked after by agents of the Débris Commission. The Federal Government has made an appropriation for dams of $250,000 and the State has appropriated a like amount, the total sum to be disbursed under the supervision of the Federal Commission. These dams are to prevent further encroachment of débris now in the streams upon the navigable rivers. For the reason stated the output of gold from three hydraulic mines is not now so great in proportion to the number of mines as when the miners were not compelled to take care of their débris and keep it out of the streams. Many of the small hydraulic mines, the owners of which have been unable financially to construct the necessary restraining dams, still remain closed down.

The year 1896 has been a very successful and profitable one throughout the mining regions of the State. Not only that, but many new large and small mining operations have been commenced, which are full of promise for the future. It is true that in some of the counties a decreased output is apparent, but this is more than made up by the rate of increase in others, so that the total increase of gold product for the State for the year is quite material, as previously stated.

There were but five counties in California which produced over a million dollars in 1895, whereas there were seven in 1896, and one of these shows a product of over two millions. Nevada County, which held first rank among the counties in 1895, maintained its lead for 1896 also, with a large increase in gold product. Calaveras was second in 1895, but Placer County takes that place for 1896, leaving Calaveras third. The fourth in rank is Amador; the fifth, Trinity; the sixth, Siskiyou, and the seventh, Tuolumne County. All the other counties of the State produced less than a million dollars.

Alpine County, which has not been in the list of bullion producers for some years, shows a yield of $400 from small placers.

Amador County, the fourth in rank as to bullion product, shows an increase in gold output of $131,421.88, and of silver, $2,678.74, a total gain of $134,100.62. The most important deep quartz-mining operations in California are carried on in this county along the Mother Lode, and, in addition to the producers, a number of other mines are being actively developed and equipped with extensive plants.

The leading producing mines in this county are the Keystone, South Spring Hill, Kennedy, Zeila, Wildman, Mahoney, and South Eureka. Most of the mines are quartz, though there are some drift, hydraulic, and placer operations also.

Butte County shows an increase in gold product of $52,055.23; a decrease in silver of $3,545.73; a total increase in product of $48,509.50. The principal producing quartz mine is the Gold Bank at Forbestown. While there are a number of other quartz mines, most of the gold from this county is derived from hydraulic, drift, river, and other forms of placer mining. The silver comes from the gold quartz mines at Forbestown.

Calaveras County shows a decrease in gold product of $171,517.29, an increase in silver of $423.00, and a total decrease of bullion product from preceding year of $171,094.29. The largest gold mine in the State in point of production is the Utica, at Angels, in this county. There are numerous mines all over the county, at Angels, Campo Seco, Comanche, Copperopolis, Douglas City, Esmeralda, Gwinmine, Jenny Lind, Milton, Mountain Ranch, Murphys, Mokelumne Hill, North Branch, Railroad Flat, Rich Gulch, Robinson Ferry, San Andreas, Valley Spring, Vallecito, Wallace, and West Point. All forms of mining are carried on, quartz being the most productive; but some good drift mines are being opened and worked. Some of the quartz operations are quite extensive, notably at Angels, Jenny Lind, and Gwinmine. At several of the camps quartz mines long abandoned are being reopened and will soon be made productive. Del Norte County shows a total yield of $24,150 gold, an increase of $15,900 from previous year. The product is mainly from the mines at Gasquet.

El Dorado County shows a marked increase of $112,274.23, mainly in gold, the silver yield being nominal. The principal quartz mines are the Church, Idlewild, Gentle Annie, Zantgraf, Grand Victory, and Big Canyon. Among the large drift mines are the Linden, Franklin, and Two Channel; the latter of which also does hydraulicking on a portion of its grounds. A great deal of placer mining is done throughout this county.

In Fresno County a falling off on yield of $18,914.40 is shown, a number of mines which were working the previous year having closed down. There are no large mining operations conducted in the county.

Humboldt County also shows a decline in gold yield, the amount being $27,542.35. The mines in the county are mainly hydraulic and placer, with some few beach-sand claims.

In Inyo County there is shown an increase in gold product of $146,364.64, a decrease in silver of $79,709.97, and a total increase in bullion yield of $66,654.97. The silver properties at Cerro Gordo, Darwin, Keeler, and Laws nearly all reduced their output, while the gold mines in all the camps increased theirs. A number of gold mines at the new Camp of Ballarat are doing well. Considerable prospecting is being done throughout the county, there being a decided revival in gold-mining operations, even in the older districts.

Kern County makes the best showing it ever has. It has increased its gold yield for the year by $359,433.41. True, the silver product shows a falling off of $11,414.65, but the total gain in yield is considerably more than the entire yield of the county the previous year. This increase is almost entirely due to the development in the Randsburg district, where a great many new quartz mines have been found and opened within the past year. There are now several active camps in the region, and a number of mills are running. Several thousand men have gone into the various camps of the district. Some dry washing and ordinary placer mining is carried on, but the main mineral resources of the country are in the quartz mines. There is now more prospecting done in Kern than in any other county of the State. Numerous small mines are being opened by their owners, who employ no labor but perform the necessary work themselves. In some of the older districts mines long since abandoned are again being reopened.

Lassen County shows an increase in gold product of $15,300 from the quartz mines at Hayden Hill.

Los Angeles increases its gold yield for the year $12,138.55. The mines are at Acton, Newhall, Palmdale, and Gorman.

Madera County, while it shows a yield of $1,240 more silver than in 1895, decreases its total bullion yield by $56,743.90. The mines are at Ahwahnee, Fine Gold, Fresno Flats, Grub Gulch, Gold Gulch, Hildredth, O'Neal's, Starville, North Fork, and Zebra. Few new operations were started, and a number of the old ones were less productive.

Mariposa County has increased its output for the year $119,187.98, which is less than was expected. The larger companies operating in the county did not make as large a yield as was expected for the year. A great many men are employed in developing work, and several old mines are being reopened. More or less capital has of late gone into the county, and a better showing should be made for the next year as developments progress.

Merced County, which makes only a nominal annual gold yield, shows a reduction of $250 for the year.

Mono County reduces its gold yield $101,136.76; its silver, $2,626.84,

and its total for the year, $103,763.60. At Benton and Lundy the product was decreased, and there was not quite so large a yield at Bodie as in the former year.

Nevada, the "banner" county of the State in point of gold product, makes a splendid record for the year, exceeding its output of the previous year over half a million dollars, and being the only county in California with a yield of over $2,000,000. Its increase in gold product is $590,940.47; of silver, $8,184.29; and total increase for the year is $599,124.76. Quartz, hydraulic, drift, and placer mines are all worked in this county, the principal interest, however, being in quartz. At Grass Valley the principal quartz mines are the Maryland, North Star, Empire, W. Y. O. D., Pennsylvania, Omaha Cons., Brunswick, Con and Menlo; and at Nevada City the principal producers are the Champion, Providence, Delaware, Mayflower, and East Harmony. Large hydraulic mining operations are carried on at North Bloomfield and North San Juan, and in all parts of the county quartz and placer mining operations are carried on on a more or less extensive scale. The main increase in gold product comes from output of the larger mines, especially those at Grass Valley and Nevada City.

Placer County, while it has some quartz mines, makes most of its product from hydraulic, drift, and other placer mines. It takes second rank for 1896 in the list of gold-producing counties, though its increase is not very large. Its gain in gold product is $75,209.51; in silver, $1,417.72; and total, $76,627.23. The largest producers among the quartz mines are the Hathaway, Gold Blossom, Herman, and Pioneer; and the largest drift mines are the Morning Star, Big Dipper, Mayflower, Red Point, and Hidden Treasure. There are some river mines, many placers, and some tailings claims. There are also a number of operating hydraulic mines. The largest and most profitable drift mining operations in the State are conducted in this county, on the Forest Hill and Iowa Hill divides. There are, moreover, large areas of this buried auriferous gravel as yet undeveloped. Numerous Chinese miners operate in this county, especially in the old gravel and tailings claims. Mining is carried on at or near Emigrant Gap, Forest Hill, Gold Run, Iowa Hill, Loomis, Michigan Bluff, Newcastle, Ophir, Rocklin, Shady Run, Sunny South, Todds, Westville Towles, Washington, Weimar, and Yankee Jims.

Plumas County is essentially a gold producing county from quartz, hydraulic, drift, and ordinary placer mines. The decrease in product for the year amounts to $140,612.96. Mining is carried on at Bucks Ranch, Beckwith, Butte Valley, Box, Crescent Mills, Cromberg, Genessee, Greenville, Granite Basin, Johnsville, Longville, La Porte, Meadow Valley, Nelson Point, Prattsville, Quincy, Spanish Ranch, Taylorsville, and Wash. Returns from the mines were fewer in number and smaller in amount than in 1895.

Riverside shows a decrease in gold output of $22,306, and increase in silver of $10,900, and a total decrease in product of precious metal of $11,406. The decrease is due to the lessened product of the larger mines at Perris, which have been in litigation.

In Sacramento County, where the yield of the mines around Folsom and Michigan Bar is all from placers, a decrease of $12,822.75 is shown.

San Bernardino County decreases its gold yield $34,637.34; its silver yield, $88,696.26, and its total yield, $123,335.50. Less gold returns were received from the mines around Needles and Victor, and the silver mines at Calico, Daggett, and Ivanpah reduced their yield. The greatest falling off is manifested at Calico, where many of the mines are idle on account of the depressed condition of the silver-mining industry.

San Diego County makes the material increase of $216,270.43 in its gold product, decreases its silver by $560, and makes a total increase of $215,710.43. There is little change in the output of the mines at Banner and Julian, and the increase comes from the mines at Hedges, Pichacho, and Escondido. At both of the latter places a number of new mines are being opened. The largest quartz mine in southern California is the Golden Cross, at Hedges, in this county.

In Santa Barbara County the Beach Sand mines at Guadaloupe and Lompoc show an increased yield of $4,592 for the year. San Luis Obispo County makes the same yield from the La Panza mines as was the case the previous year.

Shasta County decreases its gold product $182,486.41, its silver product $4,183.52, and its total output $186,669.93. Much smaller returns were received from French Gulch, Igo, Middle fork, Ono, Waugh, and Kennett. Several large producers in some of these places were closed down during the year or materially reduced their yield. The gain in other camps was not sufficient to make up the deficiency. A number of low-grade quartz claims which were not formerly worked are now enabled to sell their ore for flux to the smelters of the Mountain Mines, Limited, at Keswick. The camp at Harrison Gulch is expected to be developed largely in 1897.

Sierra County shows an increase in gold product of $91,704.90, in silver $316.74, and a total increase in bullion product of $92,021.64. There are some quartz mines in this county which are producing, but the main portion of the gold comes from drift, hydraulic, and other placer mines. A number of new ones were opened in 1896, but the increase is largely from gain in product among the older mines.

Siskiyou County increases its gold yield for the year $141,258.39, its silver $475.35, and its total $141,733.74. There are some quartz mines in operation in Siskiyou County, the largest of which in point of production is the Black Bear, but most of the gold comes from auriferous gravel in hydraulic, drift, and other placer mines. River mining

on the Klamath and its tributaries is an important feature in this county. Dredging in the river by steam machinery was commenced for the first time in 1896, and is said to have been successful. There are large fields of auriferous gravel suitable for hydraulic or drifting which have not been developed, but work in this direction is increasing from year to year. There is no trouble from any débris question in Siskiyou County, and it is not within the jurisdiction of the California Débris Commission, so the tailings do not have to be impounded. The hydraulic mines are all run without restriction of any kind, there being no navigable streams to be injured. There are apparently more mines in operation in Siskiyou than in any other county in the State, many of them, however, being small placers.

The mines at Knights Ferry and LaGrange, in Stanislaus County, made less yield than in the previous year by $9,846.50.

Trinity County increases its gold yield $129,585.17 and decreases its silver product $1,257.28. The total increase of product for the year is $128,327.89. The largest quartz mine in this county is the Brown Bear, at Deadwood, and other quartz mines are operated at Dedrick, Cœur, Coleridge, Denny, and a few other places. However, the bulk of the yield of gold is from hydraulic, drift, and other placer mines. The area of auriferous gravel in this county is quite large, and it, like Siskiyou, has no trouble about any débris question. The tailings do not have to be impounded, there being no navigable streams to be injured. Therefore, hydraulicking is carried on unrestrictedly. There are some very large enterprises being carried on, and a great many small gravel mines are also worked in all parts of the county, near the streams. Mining of different kinds is carried on near Abrams, Bigbar, Burntranch, Carrville, Cœur, Coffee Creek, Coleridge, Denny, Deadwood, Dedrick, Douglas City, Francis, Helena, Hayfork, Junction City, Lewiston, Lowdens Ranch, Minersville, Trinity Center, and Weaverville.

Tulare County shows an increase in gold product of $3,772 from the numerous small mines at White River. The mining field is on the borders of Tulare and Kern counties, and some of the White River district mines are in the latter county.

Tuolumne County increases its product for the year $403,403.36, practically all of this being gold, as the returns received of silver yield are merely nominal. A number of mines have been opened of late in this county and several old ones have been made productive by being suitably equipped with works for reducing the ore. Among the large producers of the quartz mines are the Rawhide, Jumper, Dutch, Consolidated Eureka, Mammoth, Black Oak, Keltz, Golden Gate, Bald Mountain, Star and Rose Creek, and Mountain Lily. Most of the gold is derived from the quartz mines. Capital has gone into this county of late, and the results are shown in the increased yield of the properties.

Yuba County shows a gain in gold product for the year of $60,205.43.

There has been quite a revival of mining in Yuba of late, and a number of old mines have been opened in districts where little or no work has been done for years. The principal mining is being done at Bullards Bar, Brownsville, Camptonville, Strawberry Valley, and Smartsville. Both placer and quartz mines are being operated, and in the latter class there was more done in 1895 than has been the case for some years.

The rate of wages in the different camps varies with the locality and class of work performed. Work on the surface in quartz, hydraulic, and placer mines is paid less than underground work, and the Chinese get smaller wages than the whites. In Alpine County the few men work the placers on their own account. In Amador County the average wages run $2.50 and $2.75 per day. In Butte County, where there are numerous placers of different kinds, wages vary from $1.50 to $2 and $2.50 per day and, in some places, $40 and $45 per month. In Calaveras County the mine employing the largest number of men pays an average of $2.75 per day for the whole crew. In this county there are places where wages paid are $1.50 and $2, $2.50 and $2.75, the general run being $2.50. In Del Norte County most of the mines and small placers are run by men on their own account, but where wages are paid they are not over $2 per day. Eldorado County pays an average of $2.50 per day, though in some places $2 and in others $3 are paid. In some instances $30 to $40 per month are paid. In Fresno County a good many men are working for themselves, but when they work for wages $2 is paid. In Humboldt there are men working for $25, $30, and $40 per month and board, according to the mine. Other wages are $1.50, $2, and $2.50 per day. In Inyo County there are none working for less than $2.50, while most of them get $3 per day, and in the larger quartz operations the ruling rate is $3.50 per day. In some few places they are paid $2 per day and board. Most of the men in Kern County mines are working for themselves, but those working for wages get $2 per day and board, or $2.50 and board themselves.

In Lassen County the prevailing rate is $2.50 per day, but in some few instances $3 per day. In Los Angeles there are few large operations and the men get $2 and $2.50 per day. In Madera County most of the miners are working on their own account. Wages vary from $1.75, $2, $2.50, to $2.75 per day. In Mariposa County the rate is $2.50 and $3 per day, the latter being for underground work in the large mines. Merced County miners mostly work for themselves. In Mono County the highest wages in the State are paid, the prevailing rate being $4 per day in the larger mines and camps, though in some places $3 and $3.50 per day are paid. In Nevada County, where a large number of men are at work, the prevailing rate in the most prominent quartz towns such as Grass Valley and Nevada City is $3 per day. In some instances $2 and $2.50 per day are paid. more particu-

ularly in the gravel and small quartz mines. The Chinese get $1.10 and $1.50 per day for surface mining. The principal mining in Placer County is in drift, hydraulic, tailings, and other placer claims, though there are some quartz operations. Wages paid vary according to work, the rate being $2, $2.50, $2.75, and $3, the commonest rate being $2.50. The Chinese get about $1.25 per day. In Plumas County the rate varies from $1.50 to $2, $2.25, $2.50, and $2.75 per day, and $40 and $50 per month and board. This county has various forms of placer and some quartz mines. In Riverside County the prevailing rate seems to be $2.50, though $3 is paid in some instances. In the placers in Sacramento County the Chinese get $1.25 and $1.50, and the whites $2 per day. San Bernardino County has also a varying rate, $2.50, $2.75, $3, and in one or two places, $3.25 per day. In San Diego County there are men working for $1.75, $2, $2.50, and $3 per day. The Santa Barbara County beach miners working for wages get $2 per day, and those in the placers of San Luis Obispo County, $1.50 per day. Shasta County has mainly quartz mines, and the scale of wages varies with the locality. The miners get $2 and $2.50, or $45 to $50 per month and board. The general rate is $2.50. Sierra County has mainly drift, hydraulic, and other placer, with some quartz mines, and wages are according to the character of work. In the quartz mines the wages are $3 a day, but $2, $2.50, and $2.75 are paid to whites in the other mines, the Chinese getting less. Siskiyou County has mainly gravel mines. Miners get $2, $2.25, $2.50 per day, and $30 per month and board, $40 per month and board, $45 per month and board. In some claims they get $1.50 per day and board. The Chinese here, as in other counties, get lower wages than the whites. In Stanislaus County most of the small placers are worked by miners on their own account. In Trinity County the wages are about the same as those paid in Siskiyou County. In the small quartz mines in Tulare County the men get $2 and $2.25. Tuolumne County miners get $2, $2.50, and $2.75 per day, or $40 per month and board. In Yuba they get $2 and $2.50 per day, or $40 per month and board.

It is exceedingly difficult to obtain exact data concerning the number of men engaged in gold and silver mining in California. In some counties there are large numbers of nomadic prospectors, with no permanent abiding place, far off in the mountain and desert regions of the State. Again, there are numbers of mines where one, two, or three men are at work for themselves, and these are very difficult to reach. In 1895–96 the State mineralogist of California made a census of miners, quarrymen, etc., and his total, including Chinese, was 19,508. Of these, many were working in quarries, quicksilver, borax, chrome, manganese, asphalt, coal, copper, and other mines, or in oil wells.

Questions were asked on the blanks sent out from the San Francisco mint as to the number of men employed at each mine and the number

in each camp. From estimates based on the replies to those inquiries the following table is made, showing the number of men employed in the gold and silver mines of California:

County.	Number of men.	County.	Number of men.
Alpine	4	Plumas	590
Amador	823	Riverside	232
Butte	856	Sacramento	303
Calaveras	1,188	San Bernardino	224
Del Norte	86	San Diego	695
Eldorado	1,217	San Luis Obispo	14
Fresno	110	Santa Barbara	42
Humboldt	92	Shasta	709
Inyo	220	Sierra	538
Kern	784	Siskiyou	1,953
Lassen	47	Stanislaus	50
Los Angeles	146	Trinity	836
Madera	81	Tulare	55
Mariposa	527	Tuolumne	1,052
Merced	7	Yuba	281
Mono	319	Total	16,790
Nevada	1,591		
Placer	1,118		

PRODUCT OF CALIFORNIA BY COUNTIES, 1896.

RECAPITULATION.

County.	Gold.	Silver.	Total.
Alpine	$400.00	.....	$400.00
Amador	1,523,351.28	$3,767.74	1,527,119.02
Butte	749,316.08	5,389.80	754,705.88
Calaveras	1,546,398.85	500.00	1,546,898.85
Del Norte	24,150.00	.....	24,150.00
Eldorado	812,289.26	533.96	812,823.22
Fresno	28,235.00	99.60	28,334.60
Humboldt	65,092.85	.....	65,092.85
Inyo	238,507.22	108,619.26	347,126.48
Kern	590,866.72	34,649.63	625,516.35
Lassen	40,300.00	.....	40,300.00
Los Angeles	35,468.55	.....	35,468.55
Madera	104,339.84	1,240.00	105,579.84
Mariposa	335,637.33	180.11	335,817.44
Merced	1,250.00	.....	1,250.00
Mono	451,553.78	82,283.53	533,837.31
Nevada	2,380,756.13	8,584.29	2,389,340.42
Placer	1,674,844.30	6,690.25	1,681,534.55
Plumas	462,526.57	83.04	462,609.61
Riverside	262,800.00	13,450.00	276,250.00
Sacramento	133,050.00	.....	133,050.00
San Bernardino	96,722.76	130,714.04	227,436.80
San Diego	560,578.00	40.00	560,618.00
Santa Barbara	8,592.00	.....	8,592.00

PRODUCT OF CALIFORNIA BY COUNTIES, 1896—Continued.

RECAPITULATION—Continued.

County.	Gold.	Silver.	Total.
San Luis Obispo	$3,000.00	.....	$3,000.00
Shasta	599,209.91	$24,233.68	623,443.59
Sierra	786,174.57	423.70	786,598.27
Siskiyou	1,091,264.82	652.65	1,091,917.47
Stanislaus	16,635.00	.....	16,635.00
Trinity	1,296,330.30	.....	1,296,330.30
Tulare	20,092.00	.....	20,092.00
Tuolumne	1,070,141.81	328.32	1,070,470.13
Yuba	171,687.77	.....	171,687.77
Total	17,181,562.70	422,463.60	17,604,026.30

IV.

COLORADO.

By W. J. Puckett,

Assayer in charge United States mint, Denver, Colo.

The value of the mineral production of Colorado for 1896 was—

Gold	$15,110,960
Silver (coining value)	27,859,042
Lead	2,784,065
Copper	811,782
Total	46,565,849

Two disasters materially affected the State's mining industry during the year, the first being the complete devastation of the business part of Cripple Creek by fire and the second a protracted and severe labor strike at Leadville.

The Cripple Creek fire for a time practically stopped the operations in numerous properties of that district and the return to normal conditions was necessarily slow. During the year many new and important strikes have been recorded, although the known mining area of the district has not been increased. The chlorination and cyanide mills have been treating much of the product with great saving, and several new plants are projected.

Three new mills are promised at Florence, making five in all. The new Colorado-Philadelphia chlorination mill at Colorado City with a daily capacity of 225 tons is doing excellent work.

At Leadville, from June 1 (when the miners struck for higher wages) to September 20 (when a violent attack was made against the Coronado mine), not one important property was working. After September 20 production was under the protection of the State militia, and with the aid of imported miners slowly progressed. The approximate loss in output attributable to the strike was $3,000,000. The most signal progress of the year hung upon discoveries in the Lillian, on Printer Boy Hill; the Mahala, on Carbonate Hill, and the Sedalia, on Little Ellen Hill; but exploration on Fryer Hill, Poverty Flat, in Iowa Gulch, and other sections, was conspicuous.

The San Juan region witnessed a lively revival in improved methods of mining, and the famous Tom-boy mine, in San Miguel, gave that county, which numbers many notable producers, national reputation.

Gilpin County did well during the entire year, while Boulder, Clear Creek, Summit, Park, and Ouray were exceedingly busy fields.

Creede Camp, in Mineral County, and the Aspen district made large silver contributions.

Prospecting is being vigorously prosecuted with very promising results in the new camp of Pine Creek, in Gilpin County; Dakan, in Douglas County; Bare Hills, in El Paso County; Puma, in Park County, and the Fort Collins district, in Larimer County.

Following is the production of Colorado by counties for 1896, the equivalents employed in calculating values being: Gold, $20.67 per fine ounce; silver, $1.2929+ coining value; lead, $2.83 per 100 pounds; copper, 10½ cents per pound.

PRODUCTION OF COLORADO FOR 1896, BY COUNTIES.

County.	Gold value.	Silver value.	Total value gold and silver.	Lead value.	Copper value.	Total value.
Arapahoe	$1,919	$24	$1,943	.....	.....	$1,943
Boulder	390,825	97,559	488,384	$131	$6,559	495,074
Clear Creek	803.261	1,977,785	2,781,046	130,050	21,208	2,932,304
Chaffee	196,059	157,271	353,330	22,540	58	375,928
Conejos	648	21	669	.....	.....	669
Costilla	141	.....	141	.....	.....	141
Custer	43	74,202	74,245	2,551	115	76,911
Delta	344	2	346	.....	.....	346
Dolores	10,802	266,687	277,489	.....	.....	277.489
Eagle	16,693	81,238	97,931	6,547	212	104,690
El Paso	7,512,911	78,515	7,591,426	.....	.....	7,591,426
Fremont	927	18	945	.....	.....	945
Gilpin	1,554,935	364,307	1,919,242	50,548	45.195	2,014,985
Grand	203	.....	203	.....	.....	203
Gunnison	27,116	115,115	142,231	5,107	883	148,221
Hinsdale	215,648	600,519	816.167	196,235	1,369	1,013,771
Huerfano	110	.....	110	.....	.....	110
Jefferson	18,734	5.664	24,398	.....	.....	24,398
Lake	1,472,950	8,131,121	9,604,071	764,421	422,229	10,790,721
Larimer	13	4	17	.....	.....	17
La Plata	10,790	51	10,841	.....	.....	10,841
Montrose	1,971	21	1,992	.....	.....	1,992
Mineral	52,939	1,896.384	1.949,323	42.796	.....	1,992,119
Montezuma	95	.....	95	.....	.....	95
Ouray	142,938	2,897,359	3,040,297	197,176	1,795	3,239,268
Park	138,948	144,515	283,463	9.250	2,965	295,679
Pitkin	1,543	6,045,054	6,046.597	335,585	5,495	6,387.677
Pueblo	85	33	118	.....	.....	118
Rio Grande	1,897	1,670	3,567	14	142	3,723
Routt	4,924	2.733	7.657	687	.....	8,344
Saguache	335	3,020	3,355	2.034	25	5,414
San Juan	443,298	534,581	977.879	99	57,835	1,035,813
San Juan region	477,595	2,185,203	2,662,798	104,968	50.538	2,818,304
San Miguel	1,396,298	1,339,763	2,736,061	40.970	2.250	2,779,281
Summit	213,021	514,826	727.847	82.728	5.608	816,183
County unknown	.....	343,777	343,777	789,628	187,301	1,320,706
Total	15.110,959	27,859,042	42,970,001	2,784,065	811.782	46,565,849

STATEMENT OF BULLION OPERATED ON AT THE UNITED STATES MINT, DENVER, COLO., DURING THE CALENDAR YEAR 1896.

Source.	Gold.	Silver.	Total.
COLORADO—COUNTIES.			
Arapahoe	$328.15	$0.42	$328.57
Boulder	37,681.19	168.19	37,849.38
Clear Creek	55,886.38	502.97	56,389.35
Chaffee	74,912.40	587.09	75,499.49
Conejos	637.57	1.72	639.29
Costilla	99.61	.32	99.93
Dolores	163.48	2.37	165.85
Delta	343.89	2.94	346.83
El Paso	1,044,698.03	5,068.37	1,049,766.40
Fremont	104.91	.02	104.93
Gilpin	525,422.55	4,609.45	530,032.00
Gunnison	7,835.43	100.60	7,936.03
Grand	202.51	.29	202.80
Hinsdale	284.48	.22	284.70
Huerfano	109.79	.37	110.16
Jefferson	1,963.07	14.10	1,977.17
Lake	11,315.18	74.74	11,389.92
La Plata	10,622.06	38.21	10,660.27
Mineral	6,640.15	86.98	6,727.13
Montrose	1,719.99	16.16	1,736.15
Montezuma	93.15	.42	93.57
Ouray	810.26	11.45	821.71
Park	25,410.00	211.92	25,621.92
Routt	4,690.60	29.24	4,719.84
San Juan	8,857.99	113.61	8,971.60
San Miguel	144,513.44	2,050.19	146,563.63
Summit	59,033.27	723.20	59,756.47
County unknown	787,520.41	10,130.10	797,650.51
Smelter receipts	1,101,249.89	669.80	1,101,919.69
Total	3,913,149.83	25,215.46	3,938,365.29
OTHER STATES AND TERRITORIES.			
Alaska	1,415.48	8.96	1,424.44
Arizona	93,971.18	501.96	94,473.14
California	466.78	6.30	473.08
Idaho	7,817.02	21.87	7,838.89
Mexico	370.90	.26	371.16
Montana	901.35	9.30	910.65
Nevada	2,483.09	63.22	2,546.31
New Mexico	109,055.20	756.52	109,811.72
Oregon	2,718.69	12.34	2,731.03
South Dakota	22,457.27	87.59	22,544.86
Utah	19,609.08	321.16	19,930.24
Wyoming	11,823.36	47.88	11,871.24
Total	273,089.40	1,837.36	274,926.76
MISCELLANEOUS.			
Jewelry	25,140.59	236.42	25,377.01
Uncurrent United States coin	122.22	.....	122.22
Redeposits	7,359.92	83.98	7,443.90
Total	32,622.73	320.40	32,943.13

STATEMENT OF BULLION OPERATED ON AT THE UNITED STATES MINT, DENVER, COLO., DURING THE CALENDAR YEAR, 1896—Continued.

RECAPITULATION.

Source.	Gold.	Silver.	Total.
Colorado	$3,913,149.83	$25,215.46	$3,938,365.29
Other States and Territories	273,089.40	1,837.36	274,926.76
Miscellaneous	32,622.73	320.40	32,943.13
Grand total	4,218,861.96	27,373.22	4,246,235.18

V.

IDAHO.

By Frank F. Church,

Assayer in charge United States assay office at Boise, Idaho.

The product of Idaho for the year 1896 shows a slight decrease in gold and a considerable increase in silver and lead over the production of the previous year, the increase of lead being 50 per cent, which is mostly from the Cœur d'Alene mines, in Shoshone County. The four counties—Boise, Lemhi, Owyhee, and Shoshone—are the principal gold producers, while Shoshone and Owyhee furnish the largest proportion of the silver product. Blaine and Custer counties have a number of producing silver-lead mines, which add materially to the increase for the year. Custer produced a small quantity of copper. Heretofore the State has mined practically no copper, but with the contemplated transportation facilities, which no doubt will be completed in another year to the Seven Devils district, the product of this metal should take a prominent position in the mineral output of the State.

Product of Gold and Silver in Idaho, by Counties, Calendar Year 1896.

County.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Value.	
Ada	1,323	$27,349	429	$555	$27,904
Blaine	3,236	66,894	260,889	337,303	404,197
Bingham	756	15,628	23	30	15,658
Boise	15,770	325,995	4,645	6,006	332,001
Canyon	522	10,791	27	35	10,826
Cassia	896	18,522	29	37	18,559
Custer	5,166	106,791	144,364	186,648	293,439
Elmore	3,083	63,731	1,629	2,106	65,837
Idaho	7,515	155,349	1,865	2,411	157,760
Lincoln	843	17,426	97	125	17,551
Lemhi	21,837	451,411	1,905	2,463	453,874
Owyhee	32,948	681,095	1,428,237	1,846,568	2,527,663
Oneida	631	13,044	45	58	13,102
Nez Perces	185	3,824	78	101	3,925
Shoshone	17,369	359,049	3,163,657	4,090,292	4,449,341
Washington	329	6,801	21	27	6,828
Total	112,409	2,323,700	5,007,940	6,474,765	8,798,465

TOTAL PRODUCTION OF IDAHO DURING THE CALENDAR YEAR 1896.

Metal.	Quantity.	Value.
	Fine ounces.	
Gold	112,409	$2,323,700
Silver	5,007,940	6,474,765
	Pounds.	
Lead	98,445,986	2,953,380
Total	.....	11,751,845

GOLD AND SILVER BULLION PRODUCED IN IDAHO DEPOSITED AT GOVERNMENT INSTITUTIONS DURING THE CALENDAR YEAR 1896.

Institution.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Value.	
MINTS.					
San Francisco	4,147.363	$85,733.60	967.99	$1,251.51	$86,985.11
Denver	378.148	7,817.02	32.85	42.47	7,859.49
Philadelphia	65.915	1,362.58	13.59	17.57	1,380.15
ASSAY OFFICES.					
Boise	27,693.714	572,479.87	7,508.37	9,707.57	582,187.44
Helena	24,106.985	498,335.60	376.77	487.13	498,822.73
New York	2,489.710	51,466.88	630.04	814.58	52,281.46
St. Louis	30.999	640.80	9.39	12.14	652.94
Total	58,912.834	1,217,836.35	9,539.00	12,332.97	1,230,169.32

SOURCE OF DEPOSITS AT THE UNITED STATES ASSAY OFFICE, BOISE, IDAHO, DURING THE CALENDAR YEAR 1896.

County.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Value.	
Ada	822.964	$17,012.18	128.31	$165.89	$17,178.07
Blaine	1,235.524	25,540.55	932.72	1,205.91	26,746.46
Bingham	655.355	13,547.38	13.33	17.23	13,564.61
Boise	11,769.860	243,304.59	2,645.32	3,420.14	246,724.73
Canyon	321.441	6,644.78	13.01	16.82	6,661.60
Custer	416.185	8,603.31	130.36	168.54	8,771.85
Cassia	496.120	10,255.72	20.00	25.86	10,281.58
Elmore	2,322.507	48,010.47	1,050.65	1,358.39	49,368.86
Idaho	1,367.390	28,266.45	497.89	643.72	28,910.17
Lincoln	642.348	13,278.51	56.95	73.63	13,352.14
Lemhi	836.905	17,300.37	124.69	161.21	17,461.58
Owyhee	678.607	14,028.05	423.61	547.69	14,575.74
Oneida	530.401	10,964.37	11.85	15.32	10,979.69
Shoshone	5,369.112	110,989.39	1,440.55	1,862.49	112,851.88
Washington	228.995	4,733.75	19.13	24.73	4,758.48
Total	27,693.714	572,479.87	7,508.37	9,707.57	582,187.44
Deposits of—					
Oregon	23,364.702	482,991.26	5,131.32	6,634.28	489,625.54
Washington	56.113	1,159.96	10.15	13.12	1,173.08
Redeposits	10,787.504	222,997.51	2,215.28	2,864.14	225,861.65
Total	61,902.033	1,279,628.60	14,865.12	19,219.11	1,298,847.71

VI.

MONTANA.

By Eugene B. Braden,
Assayer in charge United States assay office, Helena, Mont.

Appended hereto are tables showing in detail the production of precious metals in Montana during the calendar year 1896. A study of these tables shows that the total output of gold, silver, copper, and lead by the State during this period attained a total value of $50,732,099.13. Estimating the voting population of Montana in round numbers at 50,000, as was indicated by the vote at the Presidential election in November, 1896, this is equivalent to a production of $1,014.45 per capita of the male population over the age of 21 years. None other of the United States will show as great an addition to the wealth of the world in any one industry in proportion to its total population during the year as that furnished here by the mines of Montana.

The output of gold for this period was 211,914.961 fine ounces, of a value of $4,380,671, while the total production of silver during the same period was 15,720,022.44 fine ounces, of the coinage value of $20,324,877.47.

A comparison of the foregoing figures shows that while the production of gold increased 2,549.375 fine ounces, or $53,630.68, during 1896 over that of the preceding year, the silver output decreased from 17,701,658.11 fine ounces in 1895 to 15,720,022.44 fine ounces in 1896, or nearly 2,000,000 ounces.

The closing months of the year 1896 witnessed the largest gold-producing property in the State closed down temporarily pending the prosecution of exploration work in the mine. Besides the nonextraction of ores from this mine, others of the large gold-producing properties were idle or showed a decreased output from various causes, chief among which were the installation of new and improved milling and concentrating machinery in place of the original and experimental plants, that had come to be of too small capacity for permanent use in handling the growing output that came with development, and to the inability of owners and operators in some cases to secure necessary funds for the prosecution of exploration work and improvements. The latter cause was largely due to a general feeling of insecurity that seemed to characterize financial circles during the year and kept capi-

tal from seeking mining investments where exploration was needed to test beyond controversy the true worth and capacity of the most promising discoveries and prospects. In still other instances large properties showed a considerably decreased production, due to injudicious direction, that subsequent changes in the personnel of superintendents and other officers have already materially improved, and guarantees new life and activity to such producers.

During the year 1896 but few gold-producing properties were discovered and worked, the principal one of these being the "Mayflower" by Butte capitalists and located in the northern section of Madison County. The output of gold for the year must, therefore, have been derived from the increased copper production and from the smaller class of mines. This would indicate a material growth in the development of this latter class of properties and that the gold-mining industry of the State is in a generally prosperous condition. With the early completion of the construction work under way and the advent of more settled conditions in the financial world the year 1897 promises to witness the inauguration of a material and permanent increase in the output of mill bullion before the close of the year.

The water supply having been good during the summer season of 1896 made possible the advantageous working of much of the placer ground in the State. The total production from this source will be seen to have been 32,270.952 ounces of fine gold, of the value of $667,099.78, during the year. The large dredging plant erected on Grasshopper Creek, near Bannack, in 1895 was successfully operated throughout the season of 1896. This plant works the placer deposits near bed rock and resulted in the recovery and saving of a large amount of placer gold, which could not have been accomplished by any known method. The future installation of similar plants in Montana would greatly increase the output of placer gold. Already 600 acres of Alder Gulch, in Madison County, the most famous and largest producer of placer gold in Montana during the past, is under lease and bond to capitalists, who at present are thoroughly prospecting the ground, and, if proven profitable, will erect during the coming year a dredge similar to the one near Bannack.

The year 1897 will also witness the erection of the first plant in Montana for the extensive extraction of gold by a modification of the cyanide process. An experimental plant of this kind was successfully operated by the Montana Mining Company, Limited, at Marysville, during 1896, under the able supervision of Mr. C. W. Merrill, of California, who has attained prominence in this line of work and is a recognized authority in the same. From the runs made by this experimental plant last season it was proven that the enormous settling dams which the company have built along Silver Creek to reclaim their tailings can be worked profitably, and as a result a 400-ton plant is

now being erected for this purpose under the superintendency of Mr. Merrill. The introduction of this process into the State will undoubtedly stimulate a careful study of the same, and the future will witness its adaptation to the extraction of gold and silver from many of the low-grade ores now known to exist. This, too, would add materially to the output of gold and silver in Montana.

The silver-mining industry in Montana is steadily decreasing in importance. The mines throughout the State that have produced silver exclusively in the past, with the exception of the properties at Elkhorn and Neihart, are closed down because of the prevailing low price for this metal. However, the production of silver is still very large and makes a most creditable showing for the State. This large production is due to the greater extraction of copper ores during 1896 than in the previous year. In 1895, 49.80 per cent of the entire silver output in the State was a "by-product" from the copper ores. In 1896 the silver from this source increased to 10,614,002.62 ounces of fine silver in the total production of 15,720,022.44 fine ounces. This is equivalent to 67.50 per cent from copper ores of the entire silver production in 1896, and confirms the steady decrease in the industry already referred to.

In 1896 Montana mines and smelters put forth the enormous aggregate of 232,096,483 pounds of copper, of a value of $25,356,540.77. This shows the increase over the production for that of the previous year to have been 31,002,491 pounds, or more than four and a quarter million dollars. Practically all of this is produced by the mines located at Butte, in Silverbow County. The commercial activity created by such an industry is necessarily enormous, and the benefits resulting from the same reach into and help every section of the State. There are at present more men working in Butte than at any time in the past. Besides the market for provisions, clothing, and the other necessaries of life that is made by the presence of such an industrial force as is there employed, the direct consumption of supplies by these mining companies in underground operations is stupendous. Mr. C. M. Goodale, the eminent mining engineer of Butte, in a recent address before the Society of Montana Civil Engineers, stated that in one year these companies consumed 37,000,000 feet of lumber. From this one item the reader may get some intelligent idea of the demand thus created for steel, blasting powders, castings, and general hardware by the copper-mining industry, as well as for all other materials necessary to mining operations.

As already stated, practically all of the copper that has been produced in the State was the output of Silver Bow County. Recent discoveries, however, in the extreme northwestern portion of the State, promise a new field for the future mining of copper in Montana.

Although the least important of the mining industries in the State,

nevertheless the output of lead is no small item, and in 1896 it reached a total production of 22,521,340 pounds, equal in value $670,009.87. This sum seems small when compared with the gold, silver, and copper outputs during the year, yet operations in this one branch add several prosperous communities to the growth of the State. New silver-lead properties have been worked for the first time near Libby Creek, and Flathead County makes its advent into the list of this class of producers as a consequence, with more than 2,000,000 pounds of lead and 200,000 ounces of pure silver to its credit.

The silver-lead camp at Castle is showing new and vigorous activity. During the year the Montana Railway has been built to this camp from the main line of the Northern Pacific Railroad, near Townsend, a distance of about 67 miles. The early opening of this road for traffic will add materially to the future lead production by Montana, as this camp has been idle for some years because of the total lack of transportation facilities.

Large expenditures are being made by some of the most prominent smelting companies operating in the State, that promise improved conditions for the treatment of ore. As a consequence, it is believed that the treatment charges now made by these smelters to producers will eventually be lowered, and result in the opening and profitable working of properties yielding gold, silver, copper, and lead that are now idle, as well as securing materially increased profits to the smelters themselves. At present these improvements are in the direction of cheaper power. The erection of a large and new smelting plant is being made by the Parrot Smelting Company, of Butte, at Gaylord, on the Jefferson River, because it can be run entirely by water power, and the building of the dam across the Missouri River, at Canyon Ferry, near Helena, will generate some 8,000 horsepower and furnish the works of the United Smelting and Refining Company at East Helena with electric power at a low cost.

Taken altogether, it is safe to say that if Montana is not already the leading mining State in the Union it will become such in the near future. To use an old and homely expression of the prospector and miner, the mountains of Montana are as yet no more than "scratched over." With the advent of better times and better conditions development and exploration will continue as in the past, present discoveries will grow into large mines, and not until future generations will Montana behold the maximum production from its "everlasting hills."

DEPOSITS AT HELENA ASSAY OFFICE DURING CALENDAR YEAR 1896.

Source.	Gold.		Silver.		Total value.
	Standard ounces.	Value.	Standard ounces.	Commercial value.	
MONTANA—COUNTIES.					
Beaverhead	4,193.541	$78,019.36	318.57	$191.15	$78,210.51
Carbon	151.290	2,814.68	10.01	6.01	2,820.69
Cascade	34.486	641.60	1.57	.94	642.54
Choteau	7.842	145.90	.88	.53	146.43
Deerlodge	13,056.669	242,914.61	2,670.49	1,602.28	244,516.89
Flathead	434.312	8,080.20	31.34	18.80	8,099.00
Fergus	2,275.153	42,328.44	80.25	48.15	42,376.59
Granite	6,536.740	121,613.70	1,434.56	860.74	122,474.44
Gallatin	457.532	8,512.22	198.67	119.22	8,631.44
Jefferson	4,162.686	77,445.26	656.67	393.94	77,839.20
Lewis and Clarke	29,217.614	543,583.33	20,572.59	12,343.57	555,926.90
Madison	7,982.073	148,583.33	2,234.87	1,340.89	149,844.43
Meagher	3,102.715	57,724.87	668.91	401.36	58,126.23
Missoula	2,248.360	41,829.92	70.98	42.59	41,872.51
Park	1,680.158	31,258.76	569.81	341.86	31,600.62
Silverbow	3,715.775	69,130.63	652.45	391.45	69,522.08
Sweet Grass	9.824	182.77	3.01	1.81	184.58
Teton	199.613	3,713.72	10.86	6.52	3,720.24
Total	79,466.383	1,478,523.30	30,186.49	18,111.81	1,496,555.32
OTHER SOURCES.					
Idaho	26,785.539	498,335.45	3,418.63	2,051.30	500,386.75
Washington	4,777.279	88,879.57	1,000.34	600.20	89,479.77
Oregon	1,904.538	35,433.26	418.65	251.20	35,684.46
Alaska	5,486.720	102,078.51	1,053.78	632.26	102,710.77
Wyoming	20.549	382.31	1.26	.76	383.07
Utah	14.918	277.54	.34	.20	277.74
British Columbia	4,085.651	76,012.12	1,966.24	1,179.77	77,191.89
Jewelry	101.678	1,891.67	25.03	15.01	1,906.68
Redeposits	1,009.417	18,779.83	464.28	278.57	19,058.40
Total	44,186.289	822,070.26	8,348.55	5,009.27	827,079.53
Grand total	123,652.672	2,300,593.56	38,535.04	23,121.08	2,323,634.85

Production of Gold and Silver in Montana, Calendar Year 1896.

Summary by counties.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Coining value.
Beaverhead	5,928.183	$122,546.42	365,541.70	$472,619.58
Carbon	151.290	3,127.44	10.01	12.94
Cascade	34.486	712.89	1.57	2.03
Choteau	7.842	162.11	.88	1.14
Deerlodge	14,489.436	299,523.23	29,218.16	37,777.01
Fergus	2,275.153	47,031.58	80.25	103.75
Flathead	434.312	8,978.02	201,031.34	259,919.31
Gallatin	457.532	9,458.02	198.67	256.87
Granite	6,743.411	139,396.67	327,718.87	423,717.33
Jefferson	8,017.472	165,735.86	1,007,526.20	1,302,660.14
Lewis and Clarke	29,217.614	603,981.68	146,170.87	188,988.59
Madison	17,644.502	364,744.23	39,418.58	50,965.43
Meagher	3.102.715	64,138.80	499,668.91	646,036.57
Missoula	2,248.360	46,477.73	433,835.98	560,919.24
Park	1,680.158	34,731.95	569.81	736.72
Silverbow	59,815.755	1,236,501.40	11,120,731.78	14,378,319.89
Sweet Grass	9.824	203.08	3.01	3.89
Teton	199.613	4,126.37	10.86	14.05
Returns from custom smelters, mints, and assay offices impossible to classify by counties	59,457.303	1,229,091.52	1,548,284.99	2,001,823.01
Total	211,914.961	4,380,669.00	15,720,022.44	20,324,877.49

Bullion of Montana Production Deposited at Helena Assay Office during Calendar Year 1896.

Character.	Gold.		Silver.		Total value.
	Standard ounces.	Value.	Standard ounces.	Coining value.	
Placer gold	20,229.094	$376,354.84	2,683.32	$3,122.40	$379,477.24
Mill bullion	59,237.289	1,102,088.67	27,503.17	32,003.68	1,134,092.35
Total	79,466.383	1,478,443.51	30.186.49	35,126.08	1,513,569.59

Bullion of Montana Production Deposited at the United States Mints and Assay Offices during Calendar Year 1896.

Institution.	Gold.		Silver.		Total value.
	Standard ounces.	Value.	Standard ounces.	Coining value.	
Helena assay office	79,466.383	$1,478,443.51	30,186.49	$35,126.08	$1,513,570.43
New York assay office	38,893.216	723,594.71	1,635,923.60	1,903,620.12	2,627,214.83
Denver mint	48.448	901.36	15.51	18.05	919.41
San Francisco mint	857.814	15,959.33	210.80	245.30	16,204.63
Philadelphia mint	25.830	480.56	19.97	23.24	503.80
New Orleans mint	30.525	567.91	4.16	4.84	572.75
Total	119,322.216	2,219,947.38	1,666,360.53	1,939,037.63	4,158,985.85

PRODUCTION OF GOLD AND SILVER IN MONTANA (ORIGIN DETAILED) DURING THE CALENDAR YEAR 1896.

Origin.	Gold.		Silver.		Grand total.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Placer mining	32,270.952	$667,099.78	3,868.34	$5,001.49	$672,101.27
Mill bullion	82,823.593	1,712,115.61	676,450.66	874,602.88	2,586,718.49
In copper ores	37,473.719	774,650.51	10,614,002.62	13,723,154.90	14,497,805.41
In lead ores	6,139.869	126,922.35	4,014,454.58	5,190,405.92	5,317,328.27
In dry ores and concentrates, classed as smelting ores	53,206.828	1,099,882.75	411,246.24	531,712.30	1,631,595.05
Total	211,914.961	4,380,671.00	15,720,022.44	20,324,877.49	24,705,548.49

PRODUCTION OF COPPER AND LEAD IN MONTANA, CALENDAR YEAR 1896.

Summary by counties.	Copper.	Lead.
	Pounds.	*Pounds.*
Beaverhead	315,702	1,331,645
Flathead	.....	2,001,130
Jefferson	503,476	3,987,846
Madison	.....	25,177
Meagher	.....	501,620
Missoula	.....	4,846,205
Silverbow	228,886,962	.....
Custom smelters in addition to the above	2,390,343	9,827,717
Total production	232,096,483	22,521,340

TOTAL MINERAL PRODUCTION OF MONTANA, CALENDAR YEAR 1896.

Description.	Quantity.	Value.
Gold, fine ounces	211,914.961	$4,380,671.00
Silver, fine ounces, at $1.2929 +	15,720,022.44	20,324,877.49
Copper, fine pounds, at $10.92½ per cwt	232,096,483	25,356,540.77
Lead, fine pounds, at $2.97½ per cwt	22,521,340	670,009.87
Total value	.....	50,732,099.13

VII.

NEVADA.

By J. W. Adams,

Superintendent of the United States mint, Carson City, Nev.

Nevada's production of gold and silver for the calendar year 1896 was

Gold	$2,999,542
Silver (coining value)	1,010,006
Total	4,009,548

These figures compared with the preceding year (1895) show an increase of the gold product of $1,219,338, and a falling off in the silver production of $41,986, a net increase of $1,177,352.

It is very gratifying to note the steady and continued increase of the gold product of the State. The increase of gold in 1895 over 1894 was $559,504, which, with the increase of 1896 ($1,219,338), shows a total gain in the gold product of $1,778,842 during the past two years, the production of 1896 more than trebling the entire output ($985,700) for the year 1893.

Lincoln County stands at the head of the gold producing counties, showing an increase of $1,274,140 over its product of 1895. This large increase is due entirely to the increased production of the Delamar and April Fool mines at Ferguson district. From the reports received from this district, I am confident, barring any accident, that the output from these two mines alone will exceed $2,500,000 during 1897.

Esmeralda County reports an increase of $116,932 over its product of 1895. This is mainly from the gold properties at Silver Peak, Hawthorn, and Silver Star districts, from all of which the most encouraging reports are received, and fully justify the belief that the output for the year 1897 will greatly exceed that of the preceding year.

The new district of Gold Creek, situated in the northeastern part of Elko County, is attracting a great deal of attention and promises exceedingly well. The purchase of the old Island Mountain placers, together with a group of quartz mines, by a company of Colorado and New York capitalists, and their extensive operations, building of reservoirs, canals, and reduction works to develop these properties, should result in a large output of gold from this district.

I am informed that a sale of the Chairman mine, at Ely district, White Pine County, one of the most promising low-grade gold properties in the State, has recently been made to wealthy mining capitalists. If this sale is consummated, extensive reduction works will be erected, which, with other improvements contemplated, will call for a total investment of about $500,000.

Of the total product ($946,656) credited to the Comstock lode, Storey County, $146,000 gold and $191,000 silver—making a total of $337,000—was obtained from working over the old tailings accumulated at the mills by the Peck Brothers patent centrifugal process.

A project is on foot to extend the Sutro Tunnel to the American Flat district, southwest and adjacent to the Comstock Lode, for the purpose of developing this section. As there is known to be rich mineral deposit there, which could not be worked profitably on account of water, this undertaking, if carried out, might develop a rich mining region that, in time, would approach the output of the Comstock Lode.

The following tables are compiled from the reports received from mining companies, United States mints and assay offices, and the reports of the county auditors to the State comptroller for the four quarters ended December 31, 1896:

PRODUCT OF NEVADA FOR THE YEAR 1896.

[Estimated by Mr. J. W. Adams.]

County.	Gold.	Silver, coining value.	Total.
Churchill	$2,500	$4,500	$7,000
Douglas	3,162	174	3,336
Esmeralda	287,054	13,000	300,054
Elko	95,600	9,500	105,100
Eureka	68,650	157,300	225,950
Humboldt	31,700	22,640	54,340
Lander	72,144	114,420	186,564
Lincoln	1,850,400	126,000	1,976,400
Lyon	55,400	6,100	61,500
Nye	31,600	3,000	34,600
Storey[1]	435,532	513,124	948,656
Washoe	5,800	248	6,048
White Pine	60,000	40,000	100,000
Total	2,999,542	1,010,006	4,009,548

[1] $146,000 gold and $191,000 silver, product of tailings, included in total.

ABSTRACT STATEMENT FROM QUARTERLY ASSESSMENT ROLLS OF THE PROCEEDS OF THE MINES OF NEVADA FOR THE FOUR QUARTERS ENDED DECEMBER 31, 1896.

County.	Quanty extracted.		Gross yield or value.	Actual cost of—		Actual cost of reduction.		Total cost.
	Tons.	Pounds.		Extracting.	Transportation.	Free milling.	Freiberg process.	
Elko[1]	602	140	$43,656.76	$19,665.30	$1,861.50	$17,991.71	.....	$39,518.51
Eureka	7,899	635	169,079.47	133,278.65	9,367.85	.....	$28,103.73	170,750.23
Lander	438	1,175	57,745.34	156,253.20	.....	.....	.....	156,253.20
Lincoln	59,303	173	1,920,033.10	356,223.94	77,505.51	1,149,033.50	.....	1,582,762.95
Lyon[2]	36	14	1,500.00	1,127.00	18.00	144.00	.....	1,289.00
Storey[3]	19,283	1,893	387,451.10	521,839.93	5,472.77	115,308.65	.....	642,621.35
White Pine[4]	448	.....	8,447.88	7,690.00	1,154.50	1,132,00	.....	9,976.50
Total	88,011	30	2,587,913.65	1,196,078.02	95,380.13	1,283.609.86	28,103.73	2,603,171,74

[1] Elko County reports for June and September quarters only.

[2] Lyon County reports for September quarter only.

[3] Storey County, quarter ended September 30; estimated.

[4] White Pine County reports for March and June quarters only.

SUMMARY FOR THE YEAR 1896.

[Reported to State comptroller by county auditors. Silver computed at market value.]

Item.	Ores.	Tailings.	Total product.
Gross yield or value	$2,587,913.65	$226,414.94	$2,814,328.59
Actual cost of—			
Extracting	1,196,078.02	3,100.00	
Transportation	95,380.13	28,305.17	
Reduction—			
(Free milling)	1,283,609.86	154,085.39	
(Freiberg process)	28,103.73		
Total cost	2,603,171.74	185,490.56	2,788,662.30

Quantity extracted for four quarters ended December 31, 1896, 88,011 tons and 30 pounds; tailings, 66,406 tons and 394 pounds; total, 154,417 tons and 424 pounds.

RECAPITULATION.

Source of production.	Value.
Product for four quarters ended Dec. 31, 1896, as reported by county auditors to State comptroller	$2,814,328.59
Estimated product for the year, not reported by county auditors to State comptroller	1,195,219.41
Total product	4,009,548.00

VIII.

NEW MEXICO.

By Don. H. Kedzie.

During 1896 New Mexico produced a little less gold and a little more silver than during the previous year. There were produced in gold 40,746 ounces, nearly all of which was from quartz, valued at $814,920. Of silver there were produced 533,500 ounces, which, at a value of 67 cents per ounce, would be worth $357,445. There are about 1,000 men working in mines and mills, at wages varying from $1.50 to $3.50 per day, the average being from $2.25 to $2.50 per day. There are probably three times as many prospectors and chloriders who are not on regular wages.

Some very rich discoveries have been reported from Elizabethtown, in Colfax County, and it is expected there will be a large output from that camp in 1897.

At Steeple Rock, in Grant County, a strong company has commenced work, but as yet has produced no bullion, nor has it shipped any ore. Some 150 men are employed by the company, and 10,000 tons of ore have been mined during 1896. A mill is now being erected, and the company expects to begin shipping gold bullion in April. This camp was a large producer of gold ten years ago, but for several years has been practically idle.

On the 1st day of February the shaft of the Old Abe mine, at White Oaks, collapsed, and since then that hitherto large producer has only worked a little ore that was on the dumps at the time of the accident. Work has not yet been resumed on the mine.

The production of the Hillsboro district was some $60,000 less than the previous year.

In the summer a cloud-burst caused great damage in the Mogollon camp, in western Socorro County, from which the camp has not as yet entirely recovered.

In many of the camps of the Territory there are valuable prospects which can not be worked by the owners, as they have not the capital needed to erect the necessary reduction works. With the repeal of the alien land law or the admission of the Territory to Statehood many of these properties could be placed on the European mining market and they would soon become large producers.

The outlook is now hopeful for the production of a larger amount of bullion during the coming year.

PRODUCTION OF THE PRECIOUS METALS IN NEW MEXICO, 1896, BY COUNTIES.

County.	Gold.	Silver.
Bernalillo	$35,000	$22,000
Colfax	160,000	25,000
Donna Ana	18,000	70,000
Grant	186,920	86,445
Lincoln	60,000	12,000
Sierra	180,000	87,000
Santa Fe	25,000	5,000
Socorro	150,000	50,000
Total	814,920	357,445

IX.

OREGON.

By E. B. Braden,

Assayer in charge United States assay office, Helena, Mont.

The production of gold and silver in Oregon during the calendar year 1896 was: Gold, 62,450.368 fine ounces, of the value of $1,290,963.68; silver, 55,541.61 fine ounces, of a coinage value of $71,811.37.

Below will be found a comparison of the Oregon production of gold and silver in 1896 with the output as published for the year 1895.

Metal.	1895.	1896.	Increase and decrease.
Gold	$1,837,681.57	$1,290,963.68	[a]$546,717.89
Silver	15,192.16	71,811.37	[b]56,619.21
Total	1,852,873.73	1,362,775.05	[a]490,098.68

[a] Decrease. [b] Increase.

This shows a net decrease of nearly one-half million dollars for the year 1896. In the compilation of the statistics of the Oregon production for 1896 it has not been intended nor desired that a decreased output should be shown in the tables below the production for the year 1895, nor was such an outcome expected, as representatives of the mint service traveled over the State at the close of the calendar year, and in all of the mining regions the assurance was universally given that operations in each of the respective districts had been more extensive and important in 1896 than during the year previous or at any time in the past. The indications on every hand, as observed by the Government agent, verified the statements made by the mine operators and business men generally, that there would be an increased production throughout the entire State.

Below is a table showing the deposits of gold and silver from Oregon at the several United States assay offices and mints in 1895 and 1896:

Institution.	Gold.		Silver.	
	1895.	1896.	1895.	1896.
MINTS.				
Philadelphia	$250.68	$269.08	$3.21	$1.38
San Francisco	139,499.05	193,631.70	1,495.25	1,808.79
Carson City	2,179.66	.....	39.99	.....
Denver	2,144.32	2,718.68	22.18	23.95
ASSAY OFFICES.				
New York	335.81	.....	3.29	.....
Boise	383,086.36	482,991.26	4,184.37	6,634.44
Helena	20,185.65	35,433.26	593.49	487.16
Total	547,681.53	715,043.98	6,341.78	8,955.72

The total increase shown above for 1896 is $169,976.39. It may be seen that there was an increase in the amounts of Oregon bullion deposited and purchased at each of the United States mints and assay offices receiving the same in 1896. The reports received from the various smelters and mines being confidential, can not be published and a similar and further comparison thus effected, but the same increase for 1896 over 1895 is universally maintained throughout this latter class of returns.

It has been found impracticable to give credit of the Oregon production to the several counties. The system of collecting statistics in Montana, preparatory to distributing the production by counties, has been found to be the one best adapted for the work and has been employed in collecting the Oregon production in 1896. The carefully prepared interrogatories of the Mint Bureau were mailed to each of the known producers of precious metals in the State, but in very many instances intelligent returns were not furnished, while in still other cases no replies whatever were furnished. This lack of cooperation prevented any complete information being obtained, although much of value was obtained from the partially complete returns that were received. There is, however, a marked improvement among the producers in complying with these requests for information, and it is believed that the efforts of the Bureau in this direction have been well directed and that further work will enable such tables to be compiled.

Baker County is much the largest producer of gold and silver in Oregon. At Baker City there has been increased activity in mining operations. Bourne is also a large camp in Baker County, and has been very active. At this latter place are located the Eureka and Excelsior mines. While Baker City and Bourne are the most important mining centers of Baker County, nevertheless the smaller camps of this county have been active and in the aggregate add considerable to the output. Although the returns received from Baker County are somewhat incomplete, they are sufficient to show that the output has certainly been some $150,000 greater than in 1895.

The returns indicate that the same degree of prosperity obtained in each of the mining regions of the State as that existing in Baker County, but for the reasons already given it would be hazarding an opinion to express the amount of this increase for each of the several places in figures.

The tables that are appended hereto showing the Oregon production have been carefully compiled from reports furnished by the smelters and refineries handling the Oregon product and from returns made by the United States mints and assay offices of Oregon bullion handled by each, as well as from such information received from producers as could be safely used.

In conclusion, it is believed that while the 1896 output is shown as less than in 1895, that it is as nearly correct as it is possible to make

such statistics, and that the decrease in the Oregon output is only a seeming decrease, while in reality the production is actually some $200,000 greater than in the previous year.

BULLION OF OREGON PRODUCTION DEPOSITED AT UNITED STATES MINTS AND ASSAY OFFICES DURING THE CALENDAR YEAR 1896.

Institutions.	Gold.		Silver.		Total value.
	Standard ounces.	Value.	Standard ounces.	Coining value.	
MINTS.					
Denver	146.129	$2,718.68	20.58	$23.95	$2,742.63
San Francisco	10,407.704	193,631.70	1,554.43	1,808.79	195,440.49
Philadelphia	14.463	269.08	1.19	1.38	270.46
ASSAY OFFICES.					
Boise	25,960.780	482,991.26	5,701.47	6,634.44	489,625.70
Helena	1,904.528	35,433.26	418.65	487.16	35,920.42
Total	38,433.604	715,043.98	7,696.32	8,955.72	723,999.70

DISPOSITION OF GOLD AND SILVER BULLION OF OREGON PRODUCTION DURING THE CALENDAR YEAR 1896.

Disposition.	Value.
Deposited at United States mints and assay offices	$723,999.70
Shipped to custom smelters and refiners by producers	638,775.35
Total value of Oregon production	1,362,775.05

TOTAL PRODUCTION OF GOLD AND SILVER IN OREGON DURING THE CALENDAR YEAR 1896.

Metal.	Fine ounces.	Value.
Gold	62,450.368	$1,290,963.68
Silver	55,541.610	71,811.37
Total value of production		1,362,775.05

X.

SOUTH APPALACHIAN STATES.

By W. E. Ardrey,

Assayer in charge of the United States assay office at Charlotte, N. C.

The precious-metal yield of the South Appalachian States during 1896 was, at coining rates:

Gold	$313,543.45
Silver	2,081.30
Total	315,624.75

This shows a decrease, as compared with 1895, of a little more than $22,000. In this total Maryland, Alabama, and Tennessee exhibit a slight increase; North Carolina and South Carolina each a notable decrease, and Georgia a very considerable increase. Table A presents the data by States.

No silver ores were treated, nor was there any recovery of gold or silver from lead or copper ores.

A very small amount of ore was sent from the section for experimental treatment, but the contents cut no figure in the totals.

In all the States of this range, with the exception of Georgia, where there has been a marked and, for the most part, a healthy revival of mining, the condition of affairs was but little changed from 1895. More settled conditions of work prevail, and there is little disposition to take up novel and untried processes.

The chlorination and other kinds of reduction works have greatly increased in efficiency and are now so carefully conducted as to produce one-fifth of the amount credited to the section, viz, $62,244.88.

TABLE A.

State.	Fine ounces.		Coining value.		
	Gold.	Silver.	Gold.	Silver.	Total.
Alabama	314.202	157.98	$6,495.15	$204.25	$6,699.40
Georgia	7,221.811	612.51	149,288.07	791.94	150,080.01
Maryland	50.193	2.43	1,037.58	3.14	1,040.72
North Carolina	2,485.541	515.45	51,380.70	666.44	52,047.14
South Carolina	4,853.128	302.51	100,323.05	391.12	100,714.17
Tennessee	28.242	1.57	583.80	2.03	585.83
Virginia	214.548	17.31	4,435.10	22.38	4,457.48
Total	15,167.665	1,609.76	313,543.45	2,081.30	315,624.75

MARYLAND.

The figures for this State are given in Table B. Most of this is reported to have been derived from Montgomery County. I was unable to learn of any proposed increase of activity for 1897.

TABLE B.

County.	Fine ounces.		Coining value.		
	Gold.	Silver.	Gold.	Silver.	Total.
Montgomery	50.193	2.43	$1,037.58	$3.14	$1,042.72

VIRGINIA.

The amount of gold and silver mined is shown in Table C. No mine was operated steadily during the year, and the bullion was apparently the result of small operations. There are no signs of greater activity for 1897.

TABLE C.

County.	Fine ounces.		Coining value.		
	Gold.	Silver.	Gold.	Silver.	Total.
Culpeper	7.550	1.47	$156.09	$1.90	$157.99
Fairfax	53.055	7.53	1,096.74	9.74	1,106.48
Goochland	53.624	3.34	1,108.50	4.32	1,112.82
Louisa	29.907	.95	618.22	1.22	619.44
Miscellaneous	70.412	4.02	1,455.55	5.20	1,460.75
Total	214.548	17.31	4,435.10	22.38	4,457.48

NORTH CAROLINA.

The output is shown in Table D. No one locality yielded largely, nor did any mine make a large return. On the contrary, an unusually large part of the gold area of the State was worked by individuals and small operators, driven thereto by the depressed condition of agricultural pursuits. Graham and Surry counties, for the first time in my knowledge, have received attention from these small operators and have become producers, though the output was trifling.

The yield of the nugget-producing mines in Cabarrus and Stanly counties was lessened more than one-half, a diminution partly owing to litigation and partly to the necessarily intermittent character of all pocket mining. (Since writing the foregoing—February 18, 1897—a fine nugget was found at the Crawford mine, in Stanly County, reported to weigh several pounds.) The discovery of the large nugget at the famous Reed mine, in Cabarrus County, was the event of the year. It weighed 246.83 ounces troy.

The partial cessation of the monazite industry in the South Mountains and in Cleveland County has caused the attention of the mining

population to be turned back to the search for gold, and this section has shown a greater output. The Brazilian monazite can now be imported at less price than it costs to lay the North Carolina products down in the manufacturing centers. The home industry has, in consequence, received a severe blow, and the miners have turned their efforts again to the winning of gold. It is probable that this larger activity will continue during 1897. There has been little disposition to introduce new methods, either metallurgical or mechanical. The promoters of the cyanide treatment have made small progress, and the reduction of this tempting method to successful practice is still an unsolved problem, but it has many elements of promise.

I have no information of any important enterprise being projected for 1897.

Apart from the points noted above, I have been unable to learn of any marked change in the mining situations of this State, and do not at present see any reason to expect any important increase in 1897.

TABLE D.

County.	Fine ounces.		Coining value.		
	Gold.	Silver.	Gold.	Silver.	Total.
Anson	1.803	.15	$37.26	$0.20	$37.46
Burke	362.596	70.83	7,495.52	91.55	7,587.07
Cabarrus	242.108	28.69	5,004.82	37.09	5,041.91
Catawba	135.153	38.32	2,793.86	49.55	2,843.41
Caldwell	27.506	3.22	568.59	4.17	572.76
Cherokee	35.272	8.88	729.14	11.48	740.62
Cleveland	9.614	1.23	198.74	1.60	200.34
Davidson	25.206	3.71	521.06	4.80	525.86
Davie	1.597	.07	33.03	.09	33.12
Franklin	134.743	6.63	2,785.39	8.57	2,793.96
Gaston	252.643	45.06	5,222.61	58.26	5,280.87
Graham	9.954	1.42	205.77	1.84	207.61
Granville	3.178	.53	65.70	.69	66.39
Guilford	8.020	4.03	165.78	5.21	170.99
Iredell	.102	.....	2.10	.....	2.10
Jackson	6.463	.....	133.59	.....	133.59
Lincoln	36.511	14.20	754.75	18.36	773.11
McDowell	50.434	6.90	1,042.57	8.93	1,051.50
Mecklenburg	131.921	19.67	2,727.06	25.43	2,752.49
Montgomery	156.806	36.05	3,241.47	46.60	3,288.07
Moore	43.695	23.13	903.25	29.91	933.16
Polk	5.809	.63	120.07	.82	120.89
Randolph	132.133	20.45	2,731.42	26.44	2,757.86
Rowan	59.144	9.50	1,222.62	12.28	1,234.90
Rutherford	34.343	8.61	709.94	11.13	721.07
Stanly	143.503	16.28	2,966.47	21.05	2,987.52
Surry	1.803	.59	37.26	.76	38.02
Union	53.746	12.43	1,111.04	16.07	1,127.11
Miscellaneous	379.735	134.24	7,849.82	173.56	8,023.38
Total	2,485.541	515.45	51,380.70	666.44	52,047.14

SOUTH CAROLINA.

The production of this State, in coining value, was $100,714.17; it fell back in 1896 nearly to the amount of 1894, being only a few thousand dollars larger. This decrease was purely owing to temporary conditions. The statement made for December 31, 1895, will apply almost exactly to the situation at the close of 1896, both as to counties and to mines, hence I do not deem it necessary to make any detailed statement. Nearly the whole of this return was made from four mines and one reduction works, viz: The Brewer, in Chesterfield; the Haile and the Blackmon, in Lancaster; the Thomson, in Union; and the Blacksburg Sulphuric Acid Works, at Blacksburg, York County. These works are now producing steadily.

The distribution of the product is shown in Table E.

TABLE E.

County.	Fine ounces.		Coining value.		
	Gold.	Silver.	Gold.	Silver.	Total.
Abbeville	12.134	1.68	$250.83	$2.18	$253.01
Anderson	9.609	1.60	198.64	2.07	200.71
Chesterfield	120.264	17.70	2,486.05	22.89	2,508.94
Greenville	2.554	.17	52.80	.22	53.02
Lancaster	3,916.976	144.25	80,971.08	186.49	81,157.57
Oconee	3.875	.51	80.11	.66	80.77
Spartanburg	35.671	15.42	737.38	19.93	757.31
Union	343.545	81.21	7,101.72	105.00	7,206.72
York	365.020	33.15	7,545.63	42.86	7,588.49
Miscellaneous	43.480	6.82	898.81	8.82	907.63
Total	4,853.128	302.51	100,323.05	391.12	100,714.17

GEORGIA.

The condition of the precious-metal mining in Georgia in 1896 was in pleasing contrast with the other parts of this slope; the activity was greatly increased as compared with 1895. A large amount of preparatory work was done, which, as yet, makes no show in figures.

This statement will apply especially to White, Lumpkin, Cherokee, and Carroll counties.

The total product of the State was $150,080.01, being nearly $22,000 greater than in 1895. From an inspection of Table F it will be seen that Lumpkin County still leads, with Cherokee County as a close second. While all the mining part of the State is receiving more attention, the interest in Lumpkin almost amounts to a mining boom, but it has a substantial basis.

The mines at work in this county are Bast, Ivy, Barlow, Ralston, Findley, Lockhart, Singleton, Hand, Preacher, Crown Mountain, Mary Henry, Yahoola, Chestatee, Calhoun, Town, Garnet, Battle Branch, and Hedwig.

The river mining, by dredging and other means, on the Chestatee was a great surprise to me, and showed a notable increase over 1895. The yield from this river mining has been attributed entirely to Lumpkin, though the dredges operated up and down the Chestatee River and across it from the Hall bank to the Lumpkin bank. This credit was given to Lumpkin, as the topography of the county and the course of the affluents of the Chestatee would indicate that the north or Lumpkin side of the river was the richer source. I was unable to see any way of apportioning this product to both counties, though, should it be done, the credit of Hall would be some $4,000 greater than stated in the table, and of Lumpkin the smaller by that amount. The gold thus derived was of high grade, averaging fully .945 fine.

The yield of Rabun County was more than doubled. Habersham, Union, Cobb, Lincoln, and Milton remained substantially unchanged. In Forsyth County the only producing mine was the Charles.

The Currahee and the Alf. Smith mines, in Hall County, are nearing the producing point, apparently. The Wilkes, in Meriwether, was operated with some energy.

In White the Hamby Mountain, the Mount Yonah, and the Plattsburg mines were in operation.

In McDuffie County the Parks (Walker) and Egypt nearly maintained their usual rate of work.

The Sandy Ridge mine, in Wilkes County, and the Buford Company's property, in Gwinnett, were worked intermittently.

The Royal mine (formerly the Camille), in Haralson County, near Tallapoosa, came on the producing list in the summer of 1896 and made a steady output from that time. As the ore body here is very large, constant work may be expected. This mine is thoroughly equipped with the most approved milling machinery, and with a chlorination plant on the Thies model.

In Bartow County several mines were reported to me as under prospecting.

The famous Bonner mine, in Carroll County, near Bowden, is being reopened.

At Villa Rica, in the same county, the Clopton and the Astinol were in active work, and six other mines were under investigation. A large amount of mining property changed hands in 1896.

In Cherokee County two mines are steadily at work, viz, the Creighton and the Cherokee, with some other mines under examination with a view to work. The Creighton mine and Chlorination works fully maintained the rate of work expected, and was by far the largest single producer in the State. The reserves here are so great as to justify long continued work on a large scale. The Cherokee mine commenced its returns in the summer. This county is likely to increase its output in 1897.

I judge that the mining work and production is likely to be still greater than in 1896; it appears to me also to be in a healthy condition.

TABLE F.

County.	Fine ounces.		Coining value.		
	Gold.	Silver.	Gold.	Silver.	Total.
Carroll	135.852	2.11	$2,808.32	$2.72	$2,811.04
Cherokee	2,258.145	56.02	46,679.99	72.44	46,752.43
Cobb	38.906	2.07	804.26	2.68	806.94
Dawson	174.570	25.02	3,608.68	32.35	3,641.03
Forsyth	106.017	15.34	2,191.58	19.84	2,211.42
Habersham	2.244	.23	46.38	.29	46.67
Hall	10.059	.68	207.95	.87	208.82
Haralson	305.222	34.72	6,309.51	44.90	6,354.41
Lincoln	7.386	.68	152.69	.88	153.57
Lumpkin	2,290.094	234.56	47,340.45	303.27	47,643.72
McDuffie	659.690	97.89	13,637.01	126.57	13,763.58
Meriwether	143.823	3.87	2,973.08	5.01	2,978.09
Milton	29.401	.07	607.77	.09	607.86
Oglethorpe	.996	.23	20.59	.30	20.89
Rabun	162.900	3.46	3,367.43	4.47	3,371.90
White	511.808	63.60	10,579.97	82.23	10,662.20
Wilkes	33.587	3.42	694.30	4.42	698.72
Miscellaneous	351.111	68.54	7,258.11	88.61	7,346.72
Total	7,221.811	612.51	149,288.07	791.94	150,080.01

ALABAMA.

The output in this State in 1896, though somewhat larger than in 1895, by no means came up to the expectations.

The mines at work are the Blue Hill, the Gregory Hill, in Tallapoosa County; the Wise, in Cleburne, and the Idaho, in Clay.

The brilliant discoveries in Cleburne County in 1895 were not followed up in 1896.

The mining work in this State seems to be somewhat on the increase, and a much larger amount of petty work was done in 1896.

The production by counties is shown in Table G.

TABLE G.

County.	Fine ounces.		Coining value.		
	Gold.	Silver.	Gold.	Silver.	Total.
Clay	11.791	3.38	$243.75	$4.38	$248.13
Cleburne	33.929	1.80	701.37	2.33	703.70
Tallapoosa	178.809	61.74	3,696.32	79.82	3,776.14
Miscellaneous	89.673	91.06	1,853.71	117.72	1,971.43
Total	314.202	157.98	6,495.15	204.25	6,699.40

TENNESSEE.

Table H shows the amount for this State. Coker Creek, Monroe County, seems to be the center of such mining as is done. Most of this came from the work of women and children, but some milling work is claimed to have been done in this neighborhood.

TABLE H.

County.	Fine ounces.		Coining value.		
	Gold.	Silver.	Gold.	Silver.	Total.
Monroe	28.242	1.57	$583.80	$2.03	$585.83

XI.

SOUTH DAKOTA.

By F. R. CARPENTER,
Deadwood, S. Dak.

The production of the precious metals in South Dakota for the year 1896 was 244,705.400 ounces of gold and 178,941.55 ounces of silver. This is a gain of 15,359.656 ounces of gold and 61,255.73 ounces of silver over the production of 1895. The coinage value of the gold is $20.67+, and of the silver $1.2929+.

The gold production of South Dakota is derived wholly from a small area in the southwestern part of the State, known as the Black Hills, the geology of which is very simple. The uplift consists of a slate and schist area, forming the central and higher portions, around which the exposed outcrops of the later formations lie in concentric rings. The slate area is usually designated as Archean, but is probably of the age now designated Algonkin.

In these slates are found large mineralized "shoots," or lenses, of gold-bearing rock, in which the gold is singularly free. These deposits, to which the Homestake is referable, produce the larger part of the gold mined in the Black Hills, and they are practically inexhaustible. The Homestake alone has at least twenty years' supply in sight.

Immediately overlying these slates are the Potsdam rocks, which afford other and widely different classes of gold ores.

The base of the Potsdam formation is everywhere a coarse conglomerate, the materials of which are clearly derived from the underlying slates. As the slates carried gold, the conglomerates derived from them, as might be expected, also carry gold, especially in the neighborhood of the great deposits, like the Homestake.

These conglomerates form the so called "cement" deposits. As their origin is the same practically as recent placers, they have not inaptly been designated "fossil placers."

A more important class of ores, locally called the siliceous or refractory ores, is also found in the Potsdam rocks.

At the beginning of the Potsdam period the present slate area of the Black Hills was a slowly sinking island in the Cambrian ocean upon which the sea encroached from all sides, cutting down its shores, grinding the material so derived upon its beach to bowlders and to sand, and in time forming the lower quartzite member of the Potsdam. As the area continued to sink and the sea encroach upon it, it was finally

eovered and upon its site were deposited, in the manner described, first, the Potsdam roeks, and over them the roeks of all suceeeding ages in turn, until the close of the Cretaceous age, when an upward movement of this section began, whieh was accompanied by the eruption of trachytes, rhyolites, phonolites, and other eruptions. The sunken island was again raised above the sea, its summit eroded and then the succeeding rocks in turn, until the original slate area was laid bare, as we now find it. In this movement the silieeous ores, also ealled the Potsdam ores, were formed, apparently, in the following manner:

In the upward movement the seetion was fissured and the eruption of the porphyries took place. They were probably accompanied by thermal alkaline waters of long duration which dissolved out the gold from the deeper portions of the area and redeposited it at certain favorable horizons in the overlying rocks. By far the most favorable horizon seems to have been the top of the basal or quartzite member of the Potsdam, immediately overlying the slates. These deposits do not fill preexisting fissures, but have been formed by a metasomatic interchange. They are always accompanied by a narrow fissure, locally ealled a "vertical," not itself ore bearing, but through which the mineralizing solutions evidently came. These ore bodies occur as "shoots," which may be 1,000 or 1,500 feet long, from 5 to 50 feet wide, and usually only about 6 feet high.

While they generally oeeur upon the quartzite above mentioned, they are sometimes found at other levels of the Potsdam, and, latterly, are being found in the overlying carboniferous limestone, notably at Ragged Top, and are always extremely siliceous. They are never free milling and are always assoeiated with tellurium.

Three methods are in use for their treatment: (1) Matte smelting; (2) chlorination; (3) the cyanide proeess.

As these ores average 78 per cent silica, and basic ores carrying gold or silver are not obtainable, the diffieulty of smelting them becomes at once apparent. Still it is done. At the works of the Deadwood and Delaware Smelting Company they are mixed with about an equal weight of dolomitic limestone and about half their weight of iron pyrites, and smelted in large blast furnaces. Latterly about half the iron pyrite has been replaced by sulphide copper ores from Butte, Mont. About 10 per cent matte is formed and a slag made, carrying 50 per cent silica, but singularly free from gold. The matte is shipped to the Omaha and Grant Smelting Works at Omaha for further treatment.

The second method—ehlorination—is practiced by the Golden Reward Mining Company and by the Kildonan Milling Company. The ore is first erushed and given a preliminary roast; it is then subjected to the aetion of chlorine in revolving barrels, to which treatment it readily yields its gold eontents. This process is far cheaper than matte smelting, and seems to be the favorite mode of treating these ores, but of course the two or three ounces of silver per ton which they carry is

lost, and the tailings from the mills are not so free from gold as the slags from the smelting works.

In the third process—cyanide—the ore is crushed very fine and, without any preliminary treatment at all, is subjected to a weak solution of cyanide of potassium in large iron tanks, and yields fairly satisfactory results, especially if the ores are oxidized.

The great bulk of the Potsdam ores is too low grade to be smelted. The crying need of the section is a cheap milling process. It is thought that some modification of the cyanide process will, eventually, meet the requirements.

During the present year a moderate increase in the gold output of the Black Hills may be confidently expected. This prediction is based upon the increased milling facilities now being provided by the Homestake Mining Company, and the expressed intention of the smelting company to treat all custom ores offered, and upon the continued opening of new mines in the Potsdam area.

The Bear Gulch, Potato Creek, and Iron Creek placer mines are situated in Lawrence County, S. Dak., and, from the best information I can get from the miners, twenty-five placer mines produced (gold) for 1896, $2,800. (Fineness of gold, 0.900; value, $18 per ounce; average assay at the mint, about $19 per ounce.)

XII.

UTAH.

By A. Hanauer,
Salt Lake City, Utah.

Utah's production of the precious metals for the calendar year 1896 was 92,044 ounces gold of a value of $1,902,718, and 8,250,233 ounces silver of a coining value of $10,666,726, a total of $12,569,444. Compared with the preceding year this is an increase of 17,224 ounces gold and 108,850 ounces silver, and in value a gain of $496,771.

The gold output is the largest in the history of the State, coming mainly from Tintic and Mercur districts, in Juab and Tooele counties, respectively, and to these districts is also due the large increase over the preceding year. The silver output remained almost stationary, Park City and Bingham districts showing losses, as did also the Horn Silver, in Beaver County, while Tintic shows a gain of nearly 400,000 ounces. This district maintains its lead in both gold and silver production.

No new producing mines or districts of any magnitude have shown themselves. On the other hand, prospecting is general in all parts of the State, and no diminution in the output of either metal need be feared in the near future.

RECAPITULATION.

Source.	Gold.	Silver.
	Ounces.	*Ounces.*
Summit	4,377	3,134,820
Juab	40,470	3,955,843
Salt Lake	8,808	683,520
Tooele	36,604	113,485
Beaver	505	330,510
Utah	770	9,055
Washington	.....	15,000
Miscellaneous shipments from counties not enumerated above	510	8,000
Total	92,044	8,250,233

COMPARISON OF UTAH'S GOLD AND SILVER PRODUCT FOR THE CALENDAR YEARS 1895 AND 1896.

Year.	Gold.	Silver.
	Ounces.	*Ounces.*
1895	74,820	8,141,383
1896	92,044	8,250,233
Increase	17,224	108,850

NOTE.—Of the total output, as above given, 43,263 ounces gold and 6,103,307 ounces silver, being 47 per cent and 74 per cent, respectively, were contained in ores smelted, and 48,781 ounces gold and 2,146,926 ounces silver, being 53 per cent and 27 per cent, respectively, were milled by various processes. All placer gold is included in the latter item.

WELLS, FARGO & CO.'S BANK,
Salt Lake City, Utah, January 1, 1897.

WELLS, FARGO & CO.'S STATEMENT OF THE MINERAL PRODUCT OF UTAH FOR 1896.

	Copper.	Lead (unrefined).	Silver in bars.	Silver in base bullion and ores.	Gold in bars.	Gold in base bullion and ores.
	Pounds.	*Pounds.*	*Ounces.*	*Ounces.*	*Ounces.*	*Ounces.*
Germania Lead Works	1,327,526	19,168,700	.....	2,007,770	.....	13,148
Hanauer Smelting Works	985,250	9,804,000	.....	691,555	.....	9,865
Pennsylvania Smelting Co	531,088	14,957,690	.....	1,294,010	.....	16,252
Daly Mining Co	.....	30,560	471,499	119,066	173	155
Ontario Silver Mining Co	.....	173,460	1,081,185	33,186	654	37
Mercur Gold Mining and Milling Co	.....	.....	.....	.....	25,283	.....
Mercur district	.....	.....	.....	.....	11,515	.....
Silver Reef district	.....	.....	15,000	.....	.....	.....
Net product bars and base bullion	2,843,864	44,134,410	1,567,684	4,145,587	37,625	39,457
Contents ore shipped	717,996	29,295,650	.....	3,015,434	.....	16,814
Totals	3,561,860	73,430,060	1,567,684	7,161,021	37,625	56,271

RECAPITULATION.

3,561,860 pounds copper, at 7½ cents per pound	$267,139.50
73,430,060 pounds unrefined lead, at $37 per ton	1,358,456.11
8,728,705 ounces fine silver, at $0.6695 per ounce	5,843,868.00
93,896 ounces fine gold, at $20 per ounce	1,877,920.00
Total export value	9,347,383.61

Computing the gold and silver at their mint valuation, and other metals at their value at the seaboard, it would increase the value of the product to $15,897,266.75.

COMPARATIVE STATEMENT SHOWING THE QUANTITY OF SILVER AND GOLD CONTAINED IN BASE BULLION AND ORES PRODUCED IN UTAH.

Year.	Silver produced.	Gold produced.	Silver in ores and base bullion.	Gold in ores and base bullion.	Per cent of total silver product.	Per cent of total gold product.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*		
1877	4,359,703	17,325	2,102,098	11,035	48.2	63.6
1878	4,357,328	15,040	2,108,359	10,165	48.3	67.5
1879	3,835,047	15,932	1,797,589	5,693	46.8	35.7
1880	3,783,566	8,020	1,403,819	2,878	37.1	35.8
1881	5,400,191	7,958	2,643,899	2,622	48.9	32.9
1882	5,435,444	9,039	2,581,789	5,016	47.3	55.5
1883	4,531,763	6,991	2,351,190	5,597	51.8	80
1884	5,669,488	5,530	3,253,984	3,806	57.4	68.8
1885	5,972,689	8,903	3,189,576	7,289	53.4	81.8
1886	5,918,842	10,577	2,838,263	8,369	47.9	79.1
1887	6,161,737	11,387	5,049,273	10,714	65.7	94
1888	6,178,855	13,886	3,982,217	12,854	64.4	92.6
1889	7,147,651	24,975	5,270,250	24,236	73.7	97
1890	8,165,586	33,851	6,082,825	29,555	74.4	87.3
1891	8,015,223	36,160	6,616,198	31,240	74.2	86.4
1892	8,969,656	38,182	7,379,246	37,031	82.2	99.8
1893	7,107,503	54,072	5,700,591	35,816	80.2	66.3
1894	6,659,798	56,427	4,693,996	30,801	70.4	54.5
1895	8,223,804	65,418	6,505,701	34,097	79.1	52.1
1896	8,728,705	93,896	7,161,021	56,271	82	59.9

COMPARATIVE STATEMENT OF THE VALUE OF LEAD BULLION, INCLUDING GOLD AND SILVER NECESSARILY PRODUCED IN ITS MANUFACTURE WEST OF THE MISSOURI RIVER, COMPILED FROM THE ANNUAL REPORTS ISSUED BY JOHN J. VALENTINE, PRESIDENT OF WELLS, FARGO & CO., SAN FRANCISCO.

Year.	Total value of precious metals, including lead.	Total value of lead bullion, including gold and silver contents.	Per cent of entire product.
1878	$81,154,622	$14,740,581	13.1
1879	75,349,501	19,234,394	25.5
1880	80,167,936	28,114,594	35
1881	84,504,417	30,253,430	35.8
1882	92,411,835	35,798,750	38.7
1883	90,313,612	34,810,022	38.5
1884	84,975,954	31,191,250	36.7
1885	90,181,260	35,731,711	39.6
1886	103,011,761	44,635,655	43.3
1887	104,645,959	41,595,853	39.7
1888	114,341,592	38,004,826	33.2
1889	129,677,836	42,878,063	33.5
1890	127,166,410	46,852,367	36.8
1891	118,237,441	39,106,577	33
1892	111,531,700	41,975,610	37.6
1893	104,081,591	40,217,465	38.6
1894	105,113,489	39,202,289	37.3
1895	118,164,642	41,204,324	34.8

XIII.

WASHINGTON.

By E. B. BRADEN,

Assayer in charge United States assay office, Helena, Mont.

The tables appended hereto have been compiled from returns furnished by the various smelters and refineries handling the product of the mines of Washington and by the several mints and assay offices of the United States receiving and handling bullion originating there.

Carefully prepared interrogatories were mailed each of the mining companies, syndicates, and individuals known to be operating in the State, but for some inexplicable reason comparatively few intelligent or comprehensive replies were received, and in some cases these requests for important information were even treated in silence. Such a general lack of cooperation among those most interested has prevented the compilation of any reliable tables setting forth the production of the precious metals by the several counties in the State where mining operations have been carried on. For the same reason no comparisons by counties can be made of the production in 1896 with that of the previous years.

From a comparison of the figures in the tables herewith with those for 1895 it will be seen that the output and increase in gold and silver for 1896 was as follows:

Metal.	1895.	1896.	Increase.
Gold	$373,148.05	$395,489.51	$22,341.46
Silver	141,007.11	301,778.54	160,771.43
Total	514,155.16	697,268.05	183,112.89

Below is a similar comparison of the production of gold and silver in the State of Washington for the years 1894 and 1895:

Metal.	1894.	1895.	Increase.
Gold	$232,761.27	$373,148.05	$140,386.78
Silver	12,520.09	141,007.11	128,487.02
Total	245,281.36	514,155.16	268,873.80

An examination of the above comparisons shows an increase during 1895 and 1896 in the output of gold and confirms the belief that gold mining is rapidly increasing in importance in the State of Washington. The above comparisons also reveal much of interest in regard to the production of silver in the State. Previous to the year 1894 the silver-

mining industry of Washington was in a generally prosperous condition. The aggregate during several previous years had been large, but in common with other regions where silver mining had been carried on the mining districts in Washington, especially those yielding silver, languished in 1894 and many properties were closed entirely, the operators finding it impossible to work them at a profit. Since that time it will be seen that the increase has been almost phenomenal and that the year 1896 has witnessed a complete recovery from the depression that came in 1894. This increase, however, is not altogether due to the resumption of properties that were formerly producing and had been shut down in 1894, as new mines have been discovered and developed since that time and are among the producers for the past year. Unquestionably, with more favorable conditions existing than those that have witnessed the growth here in silver mining since 1894, any mines producing silver that are now idle would resume and the industry itself become of much greater importance than it now is. The production of copper and lead in Washington was of small value or importance, comparatively, in 1896. Of copper only 42,178 pounds were mined and smelted, while about 1,000,000 pounds of lead were put out by the mines in the State. Together, these figures represent a value of about $35,000,000 for the two metals.

BULLION OF WASHINGTON PRODUCTION DEPOSITED AT UNITED STATES MINTS AND ASSAY OFFICES DURING THE CALENDAR YEAR 1896.

Institution.	Gold.		Silver.		Total value.
	Standard ounces.	Value.	Standard ounces.	Coining value.	
MINTS.					
San Francisco	5,003.771	$93,093.41	912.07	$1,061.32	$94,154.73
Philadelphia	3.240	60.28	0.97	1.13	61.41
ASSAY OFFICES.					
Helena	4,777.279	88,879.61	1,000.34	1,164.03	90,043.64
Boise	62.348	1,159.96	11.28	13.13	1,173.09
Total	9,846.638	183,193.26	1,924.66	2,239.61	185,432.87

DISPOSITION OF GOLD AND SILVER BULLION OF WASHINGTON PRODUCTION DURING THE CALENDAR YEAR 1896.

Disposition.	Value.
Deposited at United States mints and assay offices	$185,432.87
Shipped to custom smelters and refiners by producers	511,835.18
Total value of Washington production	697,268.05

TOTAL PRODUCTION OF GOLD AND SILVER IN WASHINGTON DURING THE CALENDAR YEAR 1896.

Metal.	Fine ounces.	Value.
Gold	19,131.805	$595,489.51
Silver	233,406 85	301,778.54
Total value of production		697,268.05

XIV.

WYOMING.

By F. R. Carpenter,
Deadwood, S. Dak.

The Sand Creek and Mallory Gulch placer mines are situated in Crook County, Wyo. The product for 1896, from the best information I can get, is about $1,200 (gold), or 66.666 fine ounces. The number of men employed, all working for themselves, was 15. The gold sells for $18 per ounce here, and averages assay at the mint about $19 per ounce. The gold is nearly all sold to Spearfish and Deadwood, S. Dak., jewelers (.900 fine).

PART II.

PRODUCTION OF GOLD AND SILVER IN FOREIGN COUNTRIES.

PRODUCTION OF GOLD AND SILVER IN FOREIGN COUNTRIES.

AFRICA.

The total gold production of the Witwatersrand district in 1896 was 2,281,874 ounces, crude, as compared with 2,277,640 ounces in 1895, a decrease of 4,234 ounces. This is the figure furnished by the London Mining World and Engineering Record, January 16, 1897, and agrees very nearly with that of the Johannesburg Chamber of Mines. The output of the Rand published above, and also that of the Chamber of Mines, differ from that given by the Engineer of Mines of the State, the former exceeding the latter by 4,749 ounces, crude. The amount reported by the chamber is conceded to be more complete than that of the Government, and, as in former years, the Bureau adopts it. The figure of the yields of the remaining districts furnished by the State Engineer of Mines agree with those of the Witwatersrand Chamber of Mines.

The output in ounces, crude, of the several districts in 1896 was as follows:

	Ounces.
Witwatersrand	2,281,874
De Kaap	121,390
Lydenburg	50,387
Klerksdorp	38,818
Zoutpansberg	5,602
Other districts	857
Total	2,498,928

Corresponding to 2,117,841.48 ounces, or 65,873.71 kilograms, fine, of the value of $43,779,669, as against 2,505,412 ounces in 1895, a falling off in the total gold product of the Republic of 6,484 ounces, crude.

Notwithstanding the slight decrease in the production shown above, the progress of the auriferous industry in the Transvaal is attested by the figures reached during the last sixteen years. While the gold extracted in 1884 amounted to only 2,918 ounces, and to 1,737 in 1885, the production suddenly rose to 279,000 ounces in 1888, to 430,800 in 1889, to 540,360 in 1890, to 835,516 in 1891, and to 1,289,498 in 1892. Since the latter year it has reached, successively, 1,575,397 ounces in 1893, 2,239,865 ounces in 1894, and 2,505,412 ounces in 1895, the highest figure thus far attained.

According to the table published by the Engineer of Mines of the State, the work done in the Transvaal mines in 1896 was:

Galleries of mines bored	meters	164,940
Shafts bored	do	57,935
Ore extracted	tons	4,803,033
Ore treated mechanically	do	4,304,368
Tailings treated chemically	do	3,050,276
Enriched tailings produced	do	41,582

The mining industry of the Pretoria, Malmani, and Vrijheid districts made no progress in 1896. Their output, which was 1,653 ounces in 1895, fell to 857 ounces in 1896.

The results of the working of the mines of the Heidelberg district are included in those of the Witwatersrand.

In the Klerksdorp district, inclusive of Potchefstroom, the production declined greatly in 1896. It was only 38,818 ounces against 90,841 in 1895.

The following companies contributed to this result:

	Ounces.
The Buffelsdorn Company (2 months)	7,307
The Eastleigh (12 months)	23,935
The Elandslangte (5 months)	4,485
Others	3,091
Total	38,818

The other companies were engaged in prospecting or completing their working material.

De Kaap.—This district yielded a production in 1896 greatly superior to that of previous years; it was, in fact, larger than in any preceding year, as is shown by the output, since 1886:

	Ounces.
1885–86	17,269
1887	25,817
1888	48,891
1889	35,002
1890	20,835
1891	61,484
1892	63,471
1893	67,497
1894	92,577
1895	63,046
1896	121,390
Total	617,279

According to the Barberton Chamber of Commerce and Mines, there were obtained:

	Ounces.
By stamping	83,117
By treatment of tailings	31,790
By treatment of alluviums	195
Total	115,102

The companies which contributed to this result were:

	Ounces.
Agnes Block	235
Alluvions	195
Barret's	6,966
Joe's Reef	2,785
Montrose	184
Royal Sheba	1,616
Sheba	92,114
Swartkoppes	1,848
Three Sisters	254
United Ivy	6,359
Other sources	2,546
Total	115,102

Besides which the Sheba Company sent to England a quantity of enriched tailings or concentrates which yielded 9,455 ounces of gold. The output of this company was, in reality, 101,569, and it paid a dividend of 15 per cent for the mining year, October 1, 1895, to September 30, 1896.

The Zoutpansberg district is the most unhealthy of all. No great progress is to be expected in it.

The mines of the Lydenburg zone produced only 50,387 ounces in 1896, or 13,119 ounces less than 1895. Many of the companies working the beds of this region have been reorganized, or have been making large improvements in their plants; the work was, therefore, not continuous.

The following table gives in detail the production of the gold mines of the Witwatersrand in 1896:

Company.	Number of stamps.	Ore treated.
		Tons.
Bonanza	30	19,652
Tailings		12,058
Champ d'Or	50	55,708
Tailings		36,128
City and Suburban	160	202,850
Tailings		156,639
Crown Reef	120	198,236
Tailings		142,000
Durban Roodepoort	80	109,735
Tailings		71,112
Ferreira	80	120,772
Tailings		85,679
Geldenhuis Deep	130	144,059
Tailings		98,600
Geldenhuis Estate	120	178,439
Tailings		112,174
Geldenhuis Main Reef	30	35,018
Tailings		22,020
Georges Goch	100	130,515
Tailings		88,400

Company.	Number of stamps.	Ore treated.
		Tons.
Ginsberg	40	21,529
Tailings	.....	14,344
Glencairn	100	87,275
Tailings	.....	60,480
Henry Nourse	60	92,113
Tailings	.....	62,866
Johannesburg Pioneer	30	33,194
Tailings	.....	29,418
Jubilee	65	59,881
Tailings	.....	36,509
Jumpers	100	108,720
Tailings	.....	102,771
Lancaster, tailings	.....	3,106
Langlaagte Estate	160	236,229
Tailings	.....	133,360
Langlaagte, Block B	75	92,773
Tailings	.....	49,970
Langlaagte Royal	100	83,689
Tailings	.....	54,148
Langlaagte Star	60	28,828
Tailings	.....	21,957
Langlaagte United, tailings	60	9,289
May Consolidated	100	130,050
Tailings	.....	89,960
Meyer and Charlton	80	101,407
Tailings	.....	75,410
Minerva	40	27,643
Tailings	.....	16,397
New Chimes	40	42,451
Tailings	.....	27,276
New Comet	60	44,844
Tailings	.....	35,185
New Cresus	65	69,289
Tailings	.....	48,810
New Heidelberg Roodepoort	40	13,689
Tailings	.....	9,000
New Heriot	70	92,799
Tailings	.....	62,625
New Kleinfontain	65	8,332
Tailings	.....	8,865
New Midas	20	19,083
Tailings	.....	10,489
New Modderfontein	60	57,630
Tailings	.....	35,483
New Primrose	160	268,428
Tailings	.....	161,994
New Rietfontein	50	42,347
Tailings	.....	34,260
Nigel	30	27,449
Tailings	.....	19,984
North Randfontein	40	4,503
Orion	80	12,211
Tailings	.....	8,360
Paarl Central	60	6,607
Tailings	.....	12,021

Company.	Number of stamps.	Ore treated.
		Tons.
Porges Randfontein	60	21,763
Tailings		12,548
Princess Estate	40	42,339
Tailings		30,390
Rip (dry crushing) Rollers		13,568
Robinson	120	177,500
Tailings		158,141
Roodepoort Deep	40	39,445
Tailings		27,631
Roodepoort	40	23,851
Tailings		17,900
Salisbury	50	57,957
Tailings		37,046
Simmer and Jack	100	156,930
Tailings		90,234
Stanhope	20	15,951
Tailings		12,598
Treasury	40	55,228
Tailings		35,363
United Main Reef	70	87,226
Tailings		50,206
Van Ryn	80	54,016
Tailings		45,850
Vogelstruis Consolidated	80	8,975
Tailings		4,465
Wemmer	50	74,945
Tailings		53,125
Witwatersrand	60	23,892
Tailings		12,170
Walhuter	100	139,273
Tailings		89,140
Worcester	40	43,303

Output of Witwatersrand.

Company.	Total.	Monthly average per ton.
	Kilograms.	*Grams.*
Bonanza	563	8.16 to 27.20
Tailings	313	18.11 to 30.18
Champ d'Or	629	4.71 to 17.89
Tailings	218	1.69 to 11.30
City and Suburban	2,155	9.40 to 11.94
Tailings	1,188	6.03 to 8.02
Slack	10	.....
Crown Reef	2,476	11.47 to 13.05
Enriched tailings	381	.....
Tailings	1,307	6.72 to 10.85
Durban Roodepoort	1,512	13.27 to 14.75
Tailings	576	5.56 to 9.28
Ferreira	3,088	21.98 to 28.30
Tailings	993	6.35 to 19.04
Geldenhuis deep	1,085	4.18 to 8.76
Tailings	657	4.18 to 7.35

OUTPUT OF WITWATERSRAND—Continued.

Company.	Total.	Monthly average per ton.
	Kilograms.	*Grams.*
Geldenhuis Estate	1,666	5.74 to 10.58
Enriched tailings	120	.....
Tailings	579	3.42 to 7.35
Geldenhuis Main Reef	400	8.93 to 15.76
Tailings	176	5.55 to 9.95
George Goch	775	6.99 to 9.11
Tailings	586	6.01 to 7.52
Ginsberg	288	9.45 to 21.87
Tailings	145	5.86 to 13.47
Gloucairn	709	6.85 to 9.62
Enriched tailings	3	.....
Tailings	355	4.69 to 8.76
Henry Nourse	1,679	17.17 to 24.68
Tailings	707	7.91 to 13.15
Johannesburg Pioneer	751	21.12 to 24.04
Tailings	364	9.67 to 13.38
Jubilee	668	8.22 to 14.45
Tailings	207	4.69 to 7.05
Jumpers	1,213	8.20 to 14.89
Tailings	402	2.90 to 4.69
Lancaster	6	.....
Tailings	23	4.58 to 10.33
Langlaagte Estate	2,255	8.28 to 11.28
Enriched tailings	498	.....
Tailings	576	3.28 to 12.20
Langlaagte block B	725	4.52 to 9.28
Enriched tailings	120	.....
Tailings	165	2.16 to 4.33
Langlaagte royal	507	4.66 to 7.49
Enriched tailings	11	.....
Tailings	276	3.23 to 5.87
Langlaagte Star	167	4.52 to 8.39
Enriched tailings	22	.....
Tailings	100	3.17 to 7.95
Langlaagte United tailings	44	3.24 to 6.26
May Consol	1,212	8.73 to 10.18
Tailings	570	4.35 to 7.30
Meyer and Charlton	1,003	8.86 to 10.91
Tailings	510	4.91 to 8.22
Minerva	95	1.64 to 5.25
Tailings	206	6.87 to 15.01
New Chimes	422	6.21 to 11.58
Enriched tailings	53	.....
Tailings	97	2.03 to 4.86
New Comet	379	6.43 to 11.17
Tailings	233	3.11 to 10.49
New Cresus	599	4.78 to 12.43
Tailings	153	1.81 to 3.89
New Heidelberg Roodepoort	75	5.49
Tailings	26	2.93
New Heriot	1,385	12.71 to 23.57
Tailings	756	6.21 to 14.39
New Kleinfontein	102	10.33 to 14.67
Tailings	40	4.29 to 4.86

OUTPUT OF WITWATERSRAND—Continued.

Company.	Total.	Monthly average per ton.
	Kilograms.	*Grams.*
New Midas	179	6.82 to 11.65
Tailings	176	13.08 to 24.39
New Modderfontein	450	6.18 to 9.10
Tailings	168	1.88 to 5.89
New Primroso	2,214	6.28 to 9.71
Tailings	1,201	4.97 to 9.07
New Reitfontein	477	7.55 to 12.99
Enriched tailings	3	.....
Tailings	216	3.49 to 8.98
Nigel	386	11.58 to 17.44
Tailings	389	12.62 to 28.07
North Randfontein tailings	26	2.93
Orion	45	1.75 to 6.49
Tailings	138	14.53 to 19.71
Paarl Central	67	10.15
Tailings	58	2.50 to 9.32
Porges Randfontein	61	3.77 to 5.58
Enriched tailings	16	.....
Tailings	272	10.02 to 26.27
Princess Estate	606	12.48 to 15.23
Tailings	209	5.09 to 8.87
Rand Central or reduction of enriched tailings purchased	271	.....
Rand Central or reduction of tailings purchased	543	.....
Rip: Dry crushing	120	5.58 to 9.42
Robinson	4,030	19.19 to 25.51
Enriched tailings	331	.....
Tailings	1,483	5.92 to 18.85
Enriched tailings purchased	1,074	.....
Roodepoort deep	422	9.39 to 11.33
Enriched tailings	46	.....
Tailings	108	2.34 to 4.83
Roodepoort	208	7.13 to 9.71
Enriched tailings	55	.....
Tailings	92	2.48 to 5.82
Salisbury	620	8.87 to 12.18
Tailings	191	2.81 to 6.17
Simmer and Jack	1,954	10.60 to 13.22
Enriched tailings	231	.....
Tailings	834	6.06 to 11.10
Stanhope	173	9.57 to 12.40
Tailings	99	3.11 to 10.38
Transvaal chemically enriched tailings purchased	99	.....
Treasury	413	5.61 to 8.16
Enriched tailings	35	.....
Tailings	228	3.70 to 7.33
United Main reef	1,137	12.46 to 13.66
Tailings	306	5.13 to 7.36
Van Ryn	546	8.42 to 24.42
Tailings	200	3.23 to 9.37
Vogelstruis Consolidated	64	6.65
Tailings	16	2.34
Wemmer	1,263	13.92 to 21.34
Enriched tailings	42	.....
Tailings	400	5.70 to 11.17

OUTPUT OF WITWATERSRAND—Continued.

Company.	Total.	Monthly average per ton.
	Kilograms.	*Grams.*
Witwatersrand	244	8.67 to 9.80
Tailings	71	5.58 to 6.61
Wolhuter	1,437	9.32 to 11.41
Tailings	706	6.34 to 8.31
Worcester	721	11.42 to 20.83
Deposited in the banks without any indication of its source	265	.....

The tailings treated in the Witwatersrand in 1896 yielded 770,548 ounces 5 pennyweights of gold, or nearly 34 per cent of the total production, and 19,407 ounces more than in 1895. The several processes employed in the extraction of gold from the tailings and the amount obtained by each process is here given:

	Ounces.
Cyanuration	528,349
MacArthur Forest	130,608
Chloruration	64,650
Siemens-Halske	44,747
By fusion	1,887
Dust and slag	307
Total	770,548

WEST COAST OF AFRICA.

The figures given at the beginning of this article relate only to the gold product of the Transvaal, but may be taken to represent the output, not only of the South African Republic, but of the whole of southern Africa, for the present yield of Natal and Cape Colony is insignificant.

The gold yield of the west coast, however, is worthy of more attention, as will be seen from the following table of the gold thence exported to Great Britain in the years named:

GOLD IMPORTED INTO ENGLAND FROM THE WEST COAST OF AFRICA DURING THE YEARS 1889–1896.

Year.	Weight.		Value.	Weight.
	Standard ($916\frac{2}{3}$).	Fine.		
	Ounces.	*Ounces.*		*Kilograms.*
1889	44,554	40,841.17	$844,262	1,270
1890	37,242	34,138.50	705,705	1,062
1891	45,212	41,444.33	856,730	1,289
1892	53,402	48,951.83	1,011,924	1,523
1893	34,286	31,429	649,695	977
1894	30,326	27,798.83	574,653	865
1895	34,916	32,006.33	661,630	995
1896	33,138	30,376.50	627,938	945

Adding the production of the Transvaal to the production of the west coast of Africa thus obtained gives the following:

TOTAL PRODUCTION OF GOLD IN AFRICA FOR THE YEARS 1889–1896.

Year.	South Africa.		West coast.		Total.	
	Weight.	Value.	Weight.	Value.	Weight.	Value.
	Kilograms.		*Kilograms.*		*Kilograms.*	
1889	11,719	$7,788,372	1,270	$844,262	12,989	$8,632,634
1890	15,706	10,438,356	1,062	705,705	16,768	11,144,061
1891	22,398	14,885,639	1,289	856,730	23,687	15,742,369
1892	34,938	23,220,108	1,528	1,011,924	36,461	24,232,032
1893	42,573	28,293,831	977	649,695	43,550	28,943,526
1894	59,730	39,696,330	865	574,653	60,595	40,270,983
1895	66,045	43,893,300	995	661,630	67,040	44,554,930
1896	65,874	43,779,669	945	627,938	66,819	44,407,607

The London Mining World and Engineering Record thus comments on the production of the Rand in 1896:

RAND MINES IN 1895.

It is no stretch of language to say that the Rand mining industry during the lately departed year passed through the most critical period that has so far marked its history, and the fact that it has emerged successfully from all the difficulties with which it has been confronted proves beyond dispute not only that the district possesses an amount of inherent value and vitality, which places it in the forefront of the world's gold producers, but that the estimates, which have been put forward by experts of such eminence as Professor Schmeisser, Mr. Hamilton Smith, Mr. Hays Hammond, and Dr. Becker, lately the chief of the United States Geological Survey, have in no way exaggerated its importance. Our quarterly reviews, supplementing and consolidating the information appearing in our columns from week to week, have kept readers of the Mining World au courant with the general progress of the industry, and with the vicissitudes and the triumphs which have accompanied it; but now that we have entered upon a new year, and that the records for 1896 are available in a more or less complete form, it is desirable that we should endeavor to trace the course of events during the year.

It will be remembered that in the closing months of 1895 the gold production of the Rand district exhibited a somewhat marked falling off, owing to scarcity of water and to labor difficulties, and in the light of subsequent occurrences there can be no doubt that the coming event of political disturbances has already exercised a disturbing influence throughout the district. When the stock exchange reopened, on January 2, 1896, the "Kaffir circus" was thrown into a condition of intense excitement by the news of the Jameson raid and the surrender at Kruegersdorp. Prices fell very heavily in all directions, as it was feared that the disturbances would be prolonged, and that on the one hand mining operations would be seriously interfered with, while on the other hand there were apparently grounds for believing that the Transvaal Government would adopt a policy of reprisal upon the industry as a whole. The state of unsettlement continued for some time, and it was not really allayed until the reform prisoners were fined and liberated, and the "boys" began to return to the mines. Throughout the year, too, the ravages of the rinderpest have told adversely upon the industry, and from time to time water has run short, and the supply of labor has been fitful and uncertain. Gradually, however, more favorable conditions have come into existence, largely owing to the enactment of a new pass law regulating the supply of Kaffirs, the abolition of the drink traffic among the natives, and a concession, though at present a very inadequate one, with regard

to the cost of transport over the Netherlands Railway. President Kruger and his colleagues have thus, on balance, deserved well of the mining interest, and in well-informed quarters it is hoped that further and not less important concessions will shortly be granted; while it is obvious that internal economics in the working of the mines are gradually being effected. In the past there has been far too much speculation in shares among the local representatives, and far too little effective supervision, but the events of the year have happily resulted in a general improvement in both directions.

Under all the circumstances the production of gold from the Rand district last year was much larger than might have been reasonably expected. The yield for the closing month of the year was 206,517 ounces, a total which has only once been exceeded, namely, in August last, when a "record" output of 213,418 ounces was obtained. The December return was 5,404 ounces in excess of that for November, while as compared with the corresponding month of 1895 there was an improvement of no less than 28,089 ounces. Nothing could show more clearly than this what satisfactory progress the industry has exhibited in the face of the serious difficulties to which allusion has been made. Just to anticipate for a moment, we may observe that the Vogelstruis Company commenced crushing during December, and that the January returns will include three or four new producers. The monthly yields of the precious metal since the beginning of 1892 will be seen from the subjoined table:

	1892.	1893.	1894.	1895.	1896.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*	*Ounces.*
January	84,560	108,374	149,814	177,463	148,178
February	86,640	93,252	151,870	169,295	167,018
March	93,244	111,474	165,372	184,945	173,952
April	95,562	112,053	168,745	186,323	176,707
May	99,436	116,911	169,773	194,580	195,008
June	103,252	122,907	168,162	200,941	193,640
July	101,280	126,169	167,953	199,453	203,873
August	102,322	136,069	174,977	203,573	213,418
September	107,852	129,585	176,707	194,764	202,561
October	112,167	136,682	173,378	192,652	199,889
November	106,795	138,640	175,304	195,218	201,113
December	117,748	146,357	182,104	178,428	206,517
Total	1,210,868	1,478,473	2,024,159	2,277,635	2,281,874

The year's total of 2,281,874 ounces is a record exceeding the aggregate of the preceding year by 4,239 ounces. Since the first regular results were recorded in 1887, the Rand has now yielded a grand total of 12,769,968 ounces worth, roughly, £46,000,000. To further illustrate the progress which has been made, we show in the subjoined table the results, quarter by quarter, since the beginning of 1891:

	January to March.	April to June.	July to September.	October to December.	Year.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*	*Ounces.*
1890	109,596	114,952	127,783	142,486	494,817
1891	165,233	166,908	179,596	217,501	729,238
1892	264,453	298,250	311,354	336,810	1,210,867
1893	313,000	351,871	391,823	421,779	1,478,473
1894	467,056	506,680	519,637	530,776	2,024,159
1895	531,703	581,844	597,790	566,298	2,277,635
1896	489,148	565,355	619,852	607,519	2,281,874

The last quarter's yield of 607,519 ounces shows a reduction of 12,333 ounces, as compared with the preceding quarter; but if the comparison be made with the corresponding period of the previous year it will be found that there has been an improvement of 41,221 ounces.

The Bureau of the Mint, in previous reports of this series, published the estimates made by Mr. Hamilton Smith and Mining Counselor Schmeisser of the probable gold contents of the Rand, and as supplemental thereto here gives a similar estimate by Mr. George F. Becker, of Washington, formerly Chief of the United States Geological Survey.

Mr. Becker says:

THE PRESENT VALUE OF THE WITWATERSRAND.

The area now producing gold within 20 miles of Johannesburg can hardly fail to produce as much as £700,000,000 if mining is carried on to a depth of 4,500 or 5,000 feet. There are very good reasons for believing that the ore will maintain something like its present average tenor to this depth. Some of these reasons have been stated in the last annual report of the Consolidated Gold Fields of South Africa, and it may be added that an hypothesis lately broached, that the banket is a river deposit, is without geological foundation. The banket is a marine conglomerate beyond a doubt. The estimate of £700,000,000 for the total area down to the 5,000-foot level is, I believe, the lowest which has been made, and so far as I know no one adequately familiar with the mines would regard it as other than conservative. The difficulties and expenses of deep mining on the Rand will not be formidable, and, provided that the political and industrial conditions are reasonably favorable, the inevitable expenses peculiar to deep mining will be offset by better methods and cheapened supplies.

The dividends of the Rand mines and mills in 1895 were £2,198,943, or close to 30 per cent of the gross yield, which was £7,840,779. A large amount of money, however, was spent last year in plant and development, and it is probable that in the future at least 30 and perhaps more than 40 per cent of the gross yield will be net profit. Many gold mines in the United States do much better than this. Assuming that the present average total cost of mining, crushing, and cyaniding a ton of ore were 25s., a profit of 40 per cent would result from treating an ore yielding 41s. 8d. in bullion, and a profit of 30 per cent from an ore yielding about 35s. 7d. That these figures are fairly representative of the Rand mines is familiar to those concerned. Thirty per cent of £700,000,000 would be £210,000,000, and 40 per cent would be £280,000,000.

It would be easy to compute the present value of the Rand to purchasers were the profits distributed in dividends of the same amount each year. Of course there will be no such regularity. The product of the Rand will increase to a maximum, and eventually dwindle; indeed, it will probably pass through several maxima, of which one will, of course, be the greatest. The nearest approach to a valuation which it seems possible to make is attainable by estimating dividends as if they were constant, and then considering how the value is affected by the inevitable fluctuation in payments.

If the life of any property is twenty-five years, there will be only 24 payments to the account of the sinking fund, one at the beginning of each year after the first. If the sinking fund bears interest at 3 per cent, compounded annually, a well-known formula shows that 35.46 times the annual payment to the sinking fund must equal the present value of the property. In other words, the 24 payments to the sinking fund will aggregate a little more than two-thirds (0.677) of the present value. The property must pay, in addition to the sinking fund, 25 annual simple interest charges on the investment. On a 5 per cent basis these will aggregate one and one-quarter times the present value. Hence the total dividends will amount to $0.677 + 1.250 = 1.927$ times the present value.

If, then, the life of the Rand is twenty-five years, and if the dividends were to be distributed at a uniform rate, the estimates of total ultimate profits amounting to 30 per cent, and to 40 per cent of £700,000,000, correspond to present values of £109,000,000 and £145,000,000.

The effect of the gradual increase and ultimate decrease in the output can only be traced in a very general manner. In the earlier portion of the life of the property the dividends will fall much below their average amount, and the difference is to be regarded as a deferred payment on which interest is chargeable. During the maximum activity of the mills the dividends will exceed the average amount, and this difference is in part an anticipated payment on which interest is to be credited. On which side of the books the ultimate balance will fall depends on how soon the maximum is reached. It is clear that the sooner the maximum is attained the greater will be the real profit of the owners, and that this profit may be greater than it would be if the dividends maintained a constant average value.

That the dividends will in the course of time vastly exceed their present amount is certain. The average dividend should be from £8,400,000 to £11,200,000, and the smaller of these figures is four times the dividend of 1895. The maximum dividend may not improbably be six to eight times that of last year. Shares are affected by many causes. One of them is the amount of dividend, and it seems inevitable that Rand shares should at some future time reach very high prices.

GEORGE F. BECKER.

WASHINGTON, D. C., *December 8, 1896.*

Mr. Becker's letter drew from the London Economist of January 9, 1897, the following comments:

COMMENTS ON THE PRESENT VALUE OF THE WITWATERSRAND.

In our last issue we had the pleasure of publishing a letter on the above subject by Dr. George F. Becker, lately the chief of the United States Geological Survey, whose report upon the Rand district received prominent attention and commendation at the meeting in November last of the Consolidated Gold Fields of South Africa. Within the past couple of years Professor Schmeisser, Mr. Hays Hammond, Mr. Hamilton Smith, and other experts of less eminence have put forward estimates, more or less varying in their aggregates, of the amount of gold which will be produced from Rand mining properties from the outcrop of the banket formation to a depth of, roughly, 5,000 feet on the dip of the mineral formations, and on the strength of these estimates many utterly delusive inferences have been drawn with regard to the actual present value of Rand mining shares. For example, as we pointed out in our issue of November 21 last, one of our contemporaries, which has given a good deal of attention to the subject, referred to several instances in which the then market estimates of the values of the mines dealt with were very much less than the assumed gold contents of the properties, altogether ignoring the fact that the precious metal would have to be won at great expense over a lengthened period.

Such a confusion of gross produce and net profit would be inexcusable in the merest tyro in business matters, but when indulged in by a journal professing to provide investors with a safe guide in the selection of mining shares, the misleading character of the comparisons deserved much harsher treatment than we applied to it, for the blinking of such obvious facts as those alluded to is calculated to involve misguided people in serious losses. Dr. Becker has, however, adopted a much more intelligent attitude; and, though his conclusions may be open to some objection, they are deserving of respect and careful study, for not only does he estimate the yield of gold, but he shows what would be a reasonable present value of the Rand shares as a whole upon the basis of that estimate. His letter, therefore, marks a new and praiseworthy departure in the method of dealing with the subject on lines which we have over and over again insisted upon as absolutely necessary in any attempt to appraise Rand mining shares.

Dr. Becker assumes that the area now producing gold within 20 miles of Johannesburg can hardly fail to yield as much as £700,000,000 if mining is carried on to a depth of 4,500 or 5,000 feet from the outcrop; that in the future the profits will be at least 30 per cent, and perhaps more than 40 per cent of the gross yield, and that on an aggregate "life" of twenty-five years the present values would be £109,000,000 on the basis of 30 per cent profits, and £145,000,000 on that of 40 per cent profits. In 1895 the average profits were under 30 per cent of the gross value of the gold produced, and though various economies may result in some increase of the net earnings, it is not to be forgotten that but little deep-level mining has yet been accomplished, and that in all probability the savings in the expenditure upon the outcrop properties will be fully counterbalanced by the increase in the cost of deep working. It is true that bore-holes have proved the existence of auriferous deposits at depths of 3,200 and 5,800 feet, but the greatest depth attained by any one of the shafts is 2,000 feet, while actual extraction has not taken place lower than 1,500 feet.

We are assured that beyond the additional cost of about £1,200 per claim as an average for shaft sinking, the deep-level initial expenditure for exploration and equipment will not materially exceed that of the outcrop companies; but as heavier and more costly pumping and hauling appliances will of necessity have to be employed, it would be unwise to feel too confident as to what the proof of experience may be in the cost of the equipment of the deep levels proper. Let us assume, however, for the sake of argument, that the profits are the mean of Dr. Becker's estimates of 30 to 40 per cent; 35 per cent on £700,000,000, recoverable over a period of twenty-five years, would represent a present valuation of £127,000,000, allowing for a 3 per cent sinking fund. Taking this sum as a starting point, we propose to show how it compares with the actual market valuation of the Rand district at current quotations where any are available, plus the estimated increase of capital which it will be necessary to raise to bring to fruition the aggregate yield of £700,000,000 worth of gold. In the subjoined table particulars are given of the capital issued by the outcrop companies whose shares have lately been quoted, with the market valuations at recent prices, the shares being of the nominal value of £1 each, unless otherwise stated:

Company.	Issued capital.	Price Jan. 4.	Market valuation.
Afrikander	£190,000	£1⅛	£214,000
Angelo	221,175	3⅝	802,000
Aurora	65,000	⅞	57,000
Aurora West United	100,000	⅞	87,500
Banket	180,000	¾	135,000
Balmoral Main Reef (new)	90,000	1¾	157,500
Bantjes Consolidated	375,000	2½	937,000
Benoni	200,000	1	200,000
Bonanza	200,000	3½	700,000
Buffelsdoorn Estate	500,000	1¾	875,000
Buffelsdoorn Consolidated	275,000	½	137,000
Champ d'Or	131,624	1	131,624
Chimes (new)	122,000	¾	91,500
Chimes (West)	200,000	¾	150,000
City and Surburban (£4)	1,360,000	4⅜	1,488,000
Comet (new)	224,635	1¼	271,000
Consolidated Anglo-Tharsis	65,740	1½	98,000
Crœsus (new)	500,000	⅞	437,500
Crown Reef	120,000	10⅜	1,245,000
Drienfontein	225,000	2¼	506,000
Durban-Roodepoort	125,000	6½	812,500
Eastleigh	318,010	¾	238,500

Company.	Issued capital.	Price Jan. 4.	Market valuation.
East Orion	£275,000	£ ¼	£69,000
East Rand Proprietary	750,000	4	3,000,000
Ferreira	90,00	18¾	1,687,500
Geldenhuis Estate	200,000	3⅜	675,000
Geldenhuis Main Reef	150,000	⅝	94,000
George Goch	323,000	1⅝	524,000
Ginsberg (new)	160,000	1⅞	300,000
Glencairn Main Reef	225,000	2⅝	731,000
Henry Nourse	125,000	6⅝	844,000
Heriot (new)	111,864	7⅛	797,000
Jubilee	50,000	7¼	362,500
Jumpers	100,000	4⅜	437,500
Kimberley Roodepoort (new)	100,000	2⅛	212,500
Kleinfontein	231,250	2¼	520,000
Kleinfontein Central	225,000	⅝	141,000
Kleinfontein (new)	185.000	2¼	416,000
Knights	312,500	5⅜	1,689,000
Langlaagte Estate	470,000	4⅜	2,056,000
Langlaagte Block "B"	606,174	1⅛	682,000
Langlaagte Royal	180,000	¾	135,000
Langlaagte United (new)	146,000	¾	110,000
Luiplard's Vlei	210,000	1⅝	342,000
Main Reef (new)	135,000	1	135,000
Marievale Nigel	250,000	¾	187,000
May Consolidated	246,500	2⅜	585,000
Meyer and Charlton	83,200	5½	458,000
Midas Estate (new)	187,500	2⅛	277,000
Minerva	150,000	½	75,000
Modderfontein Extension	325,000	1	325,000
Modderfontein (new) (£4)	995,000	4	995,000
Molyneux Consolidated	220,000	1	220,000
New Blue Sky	150.000	¾	112,500
New Florida	125,000	1⅛	140,000
Nigel	200,000	2¼	450,000
North Randfontein	235,000	2	470,000
Orion (new)	128,800	⅝	80,000
Paarl Central	400,000	1	400,000
Pioneer	21,000	8½	178,500
Porges-Randfontein	487,500	1⅜	670,000
Primrose (new)	300,000	4¼	1,275,000
Princess Estate	77,000	2¼	173.000
Randfontein	1,966,500	2⅜	4,425,000
Rietfontein (new)	160,000	2	320,000
Rietknil	90,000	1	90,000
Robinson (£5)	2,750,000	8½	4,675,000
Robinson Randfontein	517,000	1½	776,000
Rothery Block	100,000	¼	25,000
Roodepoort United Mining Reef	150,000	4	600,000
Salibury (new)	98,900	2⅞	284,000
Simmer and Jack (£5)	4,700,000	4⅞	4,582,000
South Orion	160,000	¼	40,000
South Rand	300,000	1¼	375,000
Southwest Rand	176,723	¼	44,000
Spes Bona (new)	120,000	⅞	105,000
Stanhope	34,000	¾	25,000
Treasury (£4)	540,000	1⅞	252,000

Company.	Issued capital.	Price Jan. 4.	Market valuation.
Van Ryn (new)	£170,000	£4	£680,000
Van Ryn North	120,000	⅝	75,000
Van Ryn West	120,000	1¾	210,000
Village Main Reef	220,000	5⅜	1,183,000
Vogelstruis Estate	200,000	4¼	850,000
Wemmer	80,000	7½	600,000
West Kleinfontein	110,000	3¾	413,000
Wolhuter (£4)	834,800	5⅛	1,070,000
Worcester	90,727	4⅛	374,000
Total	29,735,122	.....	54,864,624

In a second table we show the capital issued by the deep-level companies and the market valuations at recent quotations in the same way.

	Issued capital.	Price Jan. 4.	Market valuation.
Central Nigel	£200,000	£2½	£500,000
Crown Reef	250,000	10¼	2,562,000
Durban-Roodepoort Deep	291,000	3½	1,019,000
French Rand	560,000	2	1,120,000
Glencairn Deep	500,000	2½	1,250,000
Geldenhuis Deep	280,000	4½	1,260,000
Jumpers Deep	300,000	4	1,200,000
Knight's Deep	430,000	1¼	507,000
Langlaagte Deep	650,000	2	1,300,000
Lancaster	234,500	2⅛	498,000
Nourse Deep	374,934	4	1,500,000
Nigel Deep	500,000	1¼	625,000
Rand Mines	332,708	25	8,318,000
Roodepoort Deep	170,000	1⅛	192,000
Roodepoort Central	220,000	1½	330,000
Robinson Deep	400,000	8	3,200,000
Rose Deep	355,000	4⅛	1,464,000
Simmer and Jack East	550,000	1⅜	756,000
Simmer and Jack West	300,000	1½	450,000
Vogelstruis Deep	327,500	1¾	573,000
Witwatersrand Deep	351,500	2	703,000
Total	7,577,142	.....	29,327,000

In addition to these, two groups of shares, debenture issues, and other loans have been effected to the amount of about £2,500,000, for which we have been unable to ascertain prices, and outcrop and deep-level shares, for which there are no recent quotations, represent at their nominal prices a further sum of about £4,000,000. We therefore arrive at the following summary:

	Issued capital.	Market valuation.
Outcrop shares	£29,735,122	£54,864,624
Deep-level shares	7,577,142	29,327,000
Debentures	2,500,000	2,500,000
Unquoted shares	4,000,000	4,000,000
Total	43,812,264	90,691,624

We now come to the requirements of the deep-level companies, which it would be extremely difficult to assess with any exactitude. There are, however, some figures to go upon which are worth considering, and which must, of course, be brought into account in such an inquiry as we have taken in hand. The existing deep-level companies own about 10,000 claims, and it is admitted that even the two principal groups, the Rand Mines and the Consolidated Gold Fields, will require to spend some £6,000,000 to bring them into the productive stage. If we placed the future capital needs of the existing deep-level companies at £15,000,000 we should probably be well under the mark. But within the area specified by Dr. Becker there are very large blocks of claims pegged out and other large blocks which have yet to be split up. The Barnato Consolidated Company, for example, owns 2,500 claims, upon very few of which even preliminary operations have been commenced, and apart from the deep-level issues specified in the second table, 5,000 claims, upon a very moderate estimate, will have to be developed and equipped before the aggregate of £700,000,000 of gold is produced. And what is all this to cost? We could wish that Dr. Becker or some other qualified expert had computed the sum. Perhaps, now that the discussion has reached a common-sense stage, the information may be forthcoming.

According to Mr. Hays Hammond, the additional cost of deep-level shaft sinking will be about £1,200 per claim. His colleague, Mr. S. B. Connor, the consulting mechanical engineer of the consolidated gold fields, places the extra cost at £1,000, and on that basis he estimates the expense of developing and equipping a deep-level mine, up to the point of actual production, at £753,000 for a property of 250 claims, or about £3,000 per claim. Professional estimates of cost are usually under rather than over the mark, and we should prefer to allow for a total expenditure of, say, £800,000 upon such a property, or £3,200 per claim, and, therefore, while our estimate of £15,000,000 for the future requirements of the existing deep levels would thus appear to be much too small, it would follow that upon the 5,000 claims, at least, which have yet to be taken in hand, development and equipment would necessitate an expenditure of fully £16,000,000, or say £31,000,000 for the whole of the deep levels. But besides this outcrop, companies such as the East Rand, Randfontein, Buffelsdoorn, and other parent undertakings will have to raise large sums before their estates reach the stage of full production; so that if we take some £40,000,000 as yet to be required for capital outlays, we believe we should err on the side of moderation.

The ability of many of the companies to raise money on favorable terms will doubtless reduce the actual nominal augmentation of capital; but any reduction on that score will have to go against the pickings of the vendors and intermediaries, and the balance may easily be adjusted. Adding £40,000,000, yet to be provided, to the £90,000,000, at which the existing properties are assessed in the market, we arrive at an aggregate of £130,000,000, or £3,000,000 in excess of the mean of Dr. Becker's calculations. Although, then, Rand shares as a whole have depreciated to the extent of fully 50 per cent since the "boom" of 1895, when we incurred widespread displeasure among our contemporaries for suggesting that prices were absurdly extravagant, the general level of current quotations is rather above than below what it should be, if the vicissitudes incidental to the most solid of mining industries, and the yet unsolved problem of the deep levels in particular, be fairly taken into consideration. (Extract from The Economist, January 9, 1897, pp. 40–42.)

ARGENTINA.

In the reply to the interrogatories of this Bureau in its annual circular relative to production of gold and silver in Argentina, the following information was received:

The reply to interrogatories regarding the production of gold and silver can best be made by the statement made to me a few days ago by the director of mines, to

the effect that an approximately accurate statement of the production last year can be had for several months, but that there will be but a slight increase, if any, over that of last year, which is as follows: Output of gold, 473.86 kilograms; output of silver, 10,210 kilograms.

These figures show an increase of the output of gold in 1895 over 1894 of 330.86 kilograms, and a decrease in the output of silver of 27,210 kilograms. These figures are supposed to represent fine gold and fine silver.

The product of the two metals in 1896 is supposed to have been the same as in 1895.

AUSTRALASIA.

The official information received regarding the yield of gold and silver in Australasia in 1896 is as follows:

Gold produced from the mines.—The deputy master of the Melbourne mint furnishes the following statement:

	Ounces.
New South Wales	296,071
New Zealand	263,722
Queensland	638,000
South Australia	29,004
Tasmania	62,586
Victoria	805,087
Western Australia	281,265
Total	2,375,735

The value, at £4 per ounce, is £9,502,940 ($46,246,057.51).

Silver produced from the mines.—The following return is also furnished by the deputy master of the Melbourne mint:

Estimated production of silver lead, silver ore, and silver bullion in Australia during 1896:

Silver lead and silver ore	tons..	307,903
Silver bullion	ounces..	629,301

The commercial value of the ounce is 2s. 9d. (66 cents).

NEW SOUTH WALES.

Production of silver lead and silver ore, 1896, 286,736 tons; value, $8,559,847. Silver bullion, 1896, 202,789 ounces.

TASMANIA.

Production, 1896: Silver lead and silver ore, 21,167 tons; value, $1,117,650.

It has been the custom of the Bureau of the Mint to estimate Australasian gold at an average fineness of 0.920. Making the deduction of 8 per cent leaves Australasia, in 1896, a net gold product of 2,185,676 ounces, or 67,984 kilograms, fine, of the value of $45,181,933.

According to the information given above, Australasia produced, in 1896, silver bullion to the amount of 629,301 ounces, of the commercial value of 2s. 9d., or 66.6 cents per ounce, and 307,903 tons of silver lead and silver ore, of the aggregated value of $9,677,497. At the average price of silver during the year in Australasia, viz, 66.6 cents, this rep-

resents 14,530,776 ounces, or 452,052 kilograms, fine. Adding this amount to that of the silver bullion given above, we have a total silver output of the colonies of 471,629 kilograms, or 15,160,077 ounces, fine, of the value of $19,600,908.

As compared with 1895, the aggregate increase in the Australasian gold yield last year was 18,558 ounces, while there was an increase of 165,496 ounces over 1894. Relatively, the greatest improvement was shown by West Australia, though actually the Victorian total showed the largest increase. In the case of Queensland, though there is an improvement on the 1895 total, the results were less favorable on the whole than in 1894; while the returns from New South Wales, New Zealand, and South Australia are disappointing.

ESTIMATED PRODUCTION OF GOLD IN AUSTRALASIA, TO THE YEAR 1896, INCLUSIVE, FROM RETURNS FURNISHED BY THE GOVERNMENT OF EACH COLONY.

Year.	New South Wales.	New Zealand.	Queensland.	South Australia.[1]	Tasmania.	Victoria.	Western Australia.	Total.
1851–1884, inclusive ...	*Ounces.* 9,596,642	*Ounces.* 10,552,279	*Ounces.* 4,529,280	*Ounces.* 154,628	*Ounces.* 378,413	*Ounces.* 53,023.985	.....	*Ounces.* 78,235,227
1885.....	103,736	237,371	310,941	18,327	37,317	735,218	.....	1,442,910
1886.....	101,416	226,668	340,998	21,115	31,014	665,396	302	1,386,909
1887.....	110,288	203,869	425,923	37,371	41,751	617,751	4,873	1,441,826
1888.....	87,503	201,219	481,643	16,763	39,610	625,026	3,493	1,455,257
1889.....	112,948	203,211	739,103	20,833	33,050	614,839	15,493	1,739,477
1890.....	127,460	193,193	610,587	24,831	20,510	588,560	22,806	1,587,947
1891.....	153,335	251,996	561,641	28,700	48,769	576,399	30,311	1,651,151
1892.....	156,870	237,392	605,612	38,974	43,278	654,456	59,548	1,796,130
1893.....	179,288	226,811	616,940	33,820	37,687	671,126	110,891	1,876,563
1894.....	324,787	221,615	675,000	35,844	57,873	716,955	207,131	2,239,205
1895.....	360,165	293,491	623,000	47,343	59,964	740,086	231,513	2,355,562
1896.....	296,071	263,722	638,000	29,004	62,586	805,087	281,265	2,375,735
Total	11,710,509	13,312,837	11,158,668	507,553	891,822	61,034,884	967,626	99,583,899

[1] Quantity received at Sydney and Melbourne mints.

QUEENSLAND.

PARTICULARS OF THE GOLD PRODUCTION IN QUEENSLAND IN 1896.

The reports from the several wardens, mineral lands commissioners, inspectors of mines, and the Government analyst are attached, and contain much valuable information. The tables have been prepared with great care, and will give official and reliable statistical data.

Five hundred and twenty thousand eight hundred and fifty tons of stone were operated on during 1896, giving a return of 609,661 ounces of gold, with an average of 1 ounce 3 pennyweights 10 grains per ton. When to this 30,724 ounces of gold from alluvial sources are added, it will be seen that the total yield has been 640,385 ounces. This represents an increase of 8,703 ounces on the previous year's product. However, this comparatively insignificant improvement in output does not by any means realize the expectations that seemed to be justified at the beginning of the year. There were two factors that have operated adversely in this respect—first and foremost, want of capital, and then again a very unfavorable season. Next to no

foreign money has found its way into our mines during the period under review, and the burden of opening up new ground or developing the old was thrown, so to say, solely on local resources.

Under such conditions not much progress can be reasonably looked forward to, but it must be notwithstanding a matter of regret that the splendid resources that lie within our reach must be allowed again to remain undeveloped for the time being. That there are hundreds of mines in this colony that would pay handsome interest on capital invested in them under capable and economic management must go without saying. Then again, on the other hand, the seasons have been anything but propitious, and scarcity of water has more or less affected both milling and alluvial operations. If gold mining has held its own during the year, the same may be said also of the other branches of the mining industry, notwithstanding the drawback of a continuance of low prices. The total value of the produce of these latter mines has been £287,649 as against £285,089 in the preceding year. The principal decreases occur in the items of tin and opal, while coal and lead show very substantial increases. There are also slight advances in copper and silver. Even a very moderate rise in these metals would assuredly have a magic effect on the dominant prosperity of such districts as Herberton, the Star, and the Sellheim, which of late have been permitted to a certain extent to lie idle and unproductive. The low prices that have been ruling in the metal market during the last few years are not holding out much inducement for investment, and the want of capital precludes the working of these mines to the greatest advantage—that is to say, in a systematic, economical, and vigorous manner, instead of in a from hand-to-mouth fashion, which naturally must be wasteful and unremunerative.

The total produce of the Charters Towers gold field for 1896 is given by the warden as 223,460 tons, and as having yielded 232,994 ounces of gold. These figures may be divided for clearness sake into 188,964 tons of vein stone for 205,838 ounces; auriferous sands, 28,935 tons for 21,461 ounces, and 5,561 tons of concentrates for 5,695 ounces of gold. Comparing these figures with the preceding year, we find that there are decreases of 48,552 tons in the quartz crushed, and of 32,056 ounces of gold obtained therefrom. These declines are due to a great extent to the amount of exploratory and developing work that has been carried on in connection with the opening of deeper ground, which has absorbed capital that might otherwise have been available for raising stone. The mines that headed the output were the Brilliant, Day Dawn Block and Wyndham, and the Brilliant and St. George.

The Brilliant Extended Block, known otherwise as the Deep Levels, has attained a depth of 2,558 feet, whilst the Brilliant Extended is only a couple of hundred feet behind. There is of late a desire for testing the deep ground thoroughly, and many of the mines are shaping their working plans accordingly.

A company has been floated with a view of working a block of freeholds adjoining the Day Dawn Block and Wyndham mine, nevertheless, that ground is, so to say, surrounded by an octopus-like net of streets that are held under lease. This undertaking means probably sinking a shaft not much less than 2,000 feet in depth, but no difficulty was experienced in forming a company for the purpose. There is also much improvement, noticeably in the working of the smaller mines. The last whim and the last whip have disappeared during the year, and the additions to the machinery all over the field have been very extensive. The ventilation of the workings in the deep ground has given some trouble during the year, and in the case of the Brilliant Extended, which has no connection with other mines, became so inefficient that work had to be suspended until a Capell fan could be procured from Europe. This has now been placed and proves thoroughly effective, and from the experience to be gained other mines doubtlessly will benefit when their ordinary air ways prove unequal to providing the necessary currents. There can be no doubt that more perfect ventilation must improve the results of mining, as men can do so much more and better work with a purer air and at a lower temperature.

One of the mines, that after many years of patient exploration—I refer to Clerke's

Brilliant Worcester and Victory—has at last appeared on the list of dividend payers, having struck a fine reef in a crosscut. The holdings on the Imperial and Old Warrior lines have not been up to expectations, and the same must apply to some extent to the Golden Surprise group of mines. The results obtained on the Columbia have been disappointing so far, though there are hopes of getting payable stone in the future.

Mount Leyshon, that has held the record of being the most economically worked mine in Australia, had to be abandoned after several years of patient trial, on account of leaving no margin above working expenses, though some few men find employment at present in working some of the small but richer veins that exist in the mountains.

As usual, there has been an excess again in the gold purchased by the banks over that returned officially. After making a liberal allowance for gold obtained by fossickers and small odd parcels, there is an excess of at least 4,000 ounces here alone. I should be exceedingly sorry to state that this gold has been obtained illegitimately; but the passing of stringent acts, as recommended by me many years ago, to regulate purchases of gold in all the colonies would be very desirable, and would help to explain what at present is a puzzle to the Department. It is desirable that the source of the gold that has shown such large discrepancies for so many years now between the amounts returned officially and the quantities shown as purchased by the banks, and those passed through the customs, should be fixed beyond any doubt whatever, even if only to divert unjust suspicions from innocent people.

The regulations passed during the year to make the working of abandoned auriferous sands a possibility has been the means of helping on the gold production to a great extent, though it must be a matter of regret that the measures should have been the source of a certain amount of litigation.

The outlying gold fields have been dull and unremunerative. The head of the Cape River appears to be worked out, and mining for quartz has ceased in the locality. The gold purchased from there by the bank was 3,011 ounces.

At Homestead, Mount Lindsay, the Black Knob, and the other provisional gold fields no development can be reported. Some prospecting areas are held on the other side of the Toomba Range and outside the gold field which are said to look promising. The population is set down at 23,290.

The Crocodile gold field, which comprises the Mount Morgan mine and about forty smaller ones held either as leases or claims, shows a large increase, and has as usual added very largely to the total output of the colony; 106,496 tons of stone produced 152,288 ounces of gold. This is an increase on the previous year of 16,144 tons and 18,898 ounces of gold. All this is the product of one mine, with the exception of 1,150 ounces which was crushed out of 2,204 tons of stone from the other holdings. The amount of alluvial gold obtained is estimated by the warden at 105 ounces, but in all probability some of the gold got has found its way to Rockhampton purchasers.

The large additions to the Mount Morgan reduction works now allow of raising much larger quantities of ore, and of putting through material of much lower grade. The capacity of the new works, when completed, is said to be equal to 50,000 tons per annum in addition to the existing plant; 1,541 men find employment in connection with this mine, being an increase of more than 400 over the previous year.

I regret I can not record much progress in connection with the other mines on this gold field. The Mount Usher mine is going to be worked energetically in the future by a company, and should produce satisfactory results. Suitable machinery has been erected, and the mine is being opened out.

One adjoining mine, the Golden Cave, yielded 120 ounces from 40 tons of stone taken from a 6-inch reef.

Very little is doing on the Struck Oil group of workings at present. The ore appears to be very difficult to deal with, and the crushing of 40 tons from No. 1, south, for 2 ounces with ordinary battery treatment was naturally not encouraging.

The Mount Victoria mine, which was proposed to be worked for a bed of auriferous deposit under the desert sandstone, has been stopped for the reason of not coming up to the expectation of the experts. The Day Dawn, which is a holding situated on the Razorback Ridge, produced a crushing of 16 tons for 54 ounces. The New Clanricard Mill, which has been improved and renovated to some extent, put through 91 tons of stone for 86 ounces of gold, and the mine when thoroughly opened up should give satisfactory results. It is but natural that prospecting should be going on in the immediate vicinity of Mount Morgan, as the striking of a continuation of the rich deposits there would be a matter of supreme importance. However, nothing very important has been reported from there so far.

A number of claims and prospecting areas are in force at Bouldercombe, and their holders appear to be satisfied with their prospects. One reef, the Union, is from 5 to 8 feet thick, and from the fact that the owners have been able to see their way of late to put on more powerful winding gear evidently promises well.

The produce of the Rockhampton gold fields, 3,788 ounces, exhibits an increase of 1,360 ounces over the previous year. The different sources may be divided into 2,060 ounces from quartz, 996 ounces from alluvial workings, and 730 ounces from the cyaniding of 1,456 tons on tailings. Toward the first item Morinish furnished 1,301 ounces, Ulam 428 ounces, Cawarral 146 ounces, and Canoona 76 ounces. The alluvial gold came principally from Ulam, Rosewood, and Cawarral. The Alliance mine, at Morinish, heads the list with 1,195 ounces. The ore here is of a very refractory nature, and is associated with considerable quantities of copper. At Ulam the Golden Spur produced 54 tons for 97 ounces. This reef and the Queenslander are said to look very promising; but on the other hand a mine that was floated as the Great Boulder Extended crushed 25 tons with a yield below five hundredweight only. Stanwell has proved a failure so far, the Native Cat Claim having yielded only 31 ounces from 126 tons of stone. Ridgelands is left to the fossicker, while at Coonyan very little is doing. The population is estimated by the warden at 779, and is increasing, more particularly at Cawarral and New Zealand Gully.

The returns from the Croydon gold field are satisfactory, and speak volumes for its intrinsic merits, but their has not been the advance made that one might reasonably have looked forward to. The increase in the yield of gold was 10,804 ounces, though 2,516 tons less stone was put through the mills. The gold came out of 297 different shafts, proving on the face of it the smallness of the holdings and the primitive style of working that is, of course, compulsory under such conditions. I fail to see how this field can hope to attain the important position that is clearly its due unless there is more combination of forces.

Systematic and economic operations become an impossibility on such small areas, and the cost of production must, naturally, be doubled if not quadrupled. In illustration, I may say here that not less than 731 claims were applied for during the past year.

The Golden Gate district has increased its output to 34,716 ounces, being about three times as much as the previous year's yield, and has made the payment of £28,000 in dividends from one mine alone a possibility. There have been many good crushings from other parts of the field as well, making the total output 37,510 tons for 66,351 ounces, at an average of more than 1¾ ounces per ton; 22,817 tons of tailings yielded 19,555 ounces. These figures give an average earning for every miner employed of 74 ounces 14 pennyweights 9 grains, equal to a money value of £185 11s.

The old complaint of want of water has made itself even more felt this year than usual, and in fact at the end of the year ten of the mills were hung up from this cause. Some water is being obtained from some of the old shafts, but better provision for the storage of water in such an uncertain climate is an absolute necessity if the gold-mining industry is to flourish. A large quantity of improved machinery is being placed on the gold field and crushing charges have in some instances been

reduced as low as 10s. per ton. Some very complete mills are now available at the Waratah and the Jubilee mines, and such good examples doubtlessly will lead to imitation by others. Very little has been done at Esmeralda, where the output did not exceed 500 ounces. The total population is estimated at 3,907, and there has been even an increase in the number of miners of 86.

Only a few mines here are owned by companies, but these were able to pay £54,252 in dividends. The calls amounted to £15,446.

About 1,000 ounces of gold can not be accounted for, being the difference between the amounts returned by the mills and mine owners and those as purchased by the banks; and the source where this came from must therefore be left to speculation, as it has been in the past.

The Croydon gold field is sure of a prosperous future, but operations will have to be conducted on different lines than those followed hitherto if its potentialities are to be practically demonstrated. For instance, sinking 380 feet with a whip can hardly be called workmanlike mining, to say nothing of the disregards of the safety of the lives of the men employed below. There are large lodes from 8 to 10 feet on this field that will probably yield half an ounce per ton, but these must be worked on a larger scale than the one in vogue up to now, and require sufficient capital to provide the necessary appliances and efficient management. Many of the mines that were household words in Croydon some years ago, such as the Iguana, Mountain Maid, True Blue, Queen, Nancy Lee, and many more deserve a more thorough trial than they possibly can have had, when we consider that the ground there below 300 feet may be said to be untried. For the present it may be anticipated that the Golden Gate line of mines, the Waratah and the Jubilee, will largely help to keep up the Croydon returns for the new year.

There are only two cyanide plants at work on the gold field at present, the supplies of old tailings having been nearly exhausted.

Since the commencement of this mode of recovering gold 72,000 tons were operated on, resulting in 62,000 ounces of bullion.

Last year was pronounced by the people on the Gympie gold field a rather dull one, but a careful analysis discloses many encouraging results. No doubt the flooding of a number of the southern mines, which unfortunately threw a large number of men out of work, and which was the outcome of the disobedience of one mine manager in not shutting down his floodgates, as had been ordered by the board, had a very depressing effect. Many of these miners, with their occupation gone, had to take themselves to other places, so that there was at the end of the year a decrease in the population of about 600. When to this are added the after effects of over-speculation in the previous year, it is astonishing to find this old gold field having held its ground so bravely.

The decrease in the gold output amounted to only 4,726 ounces, 64,241 tons having yielded 73,262 ounces; but the average has risen to 1 ounce 2 pennyweights 19 grains per ton, though the quality has been just a shade inferior. If there was a decrease of £11,434 in dividends, the reduction in calls by £34,795 should present some consolation to the shareholders; also it should be noted that the gold was the product of the labor of a much smaller number of men, who were unfortunately 430 short of those employed in the previous year, but the earnings per man show about £50 better than those of 1895.

There have been some excellent crushings. For instance, the No. 7 South Lady Mary put through 117 tons for 873 ounces and the South New Zealand Junction 50 tons for 787 ounces. Another noteworthy fact is that very nearly half the gold obtained could be converted into dividends. As might have been expected, the dead work done did not come up to the previous years, as the majority of the leases applied for during the boom had to be abandoned.

Still much valuable work of a prospecting nature can be recorded, among which I may more particularly mention the fact that the Gympie Gold Mining Company sunk their shaft to 1,433 feet, striking the slate at a much deeper level than has been

the case so far. The Australasian also got their shaft down to very nearly 1,000 feet, and if successful in proving the existence of the Smithfield Reef in their ground, and at such a depth, great impetus to mining will be imparted to Gympie mining.

I may draw attention here to the fact that a good proportion of the year's gold has been the product of mines situated to the east of the great Smithfield crosscourse. There should be plenty of room here for profitable investment, for it would be absurd to presume for a moment that all the gold has been taken from the old ground, and many rich patches must have been left for future operations. There also are good reefs on the south side of the Mary River, and those at the Two-Miles may be said to never have had a fair trial.

The outside mining centers attached to the Gympie field have made no progress during the year. At Kilkivan the Rise and Shine has been the only mine at work, while Glastonbury has supported only about a dozen men. Running Creek produced 70 tons of stone for 82 ounces. A good deal of prospecting is going on in this locality, but principally on freehold land.

The Peak Downs gold field, which is in reality the only alluvial gold field in the colony of any great importance at present, has experienced a very good year. There has been an increase in the amount of gold won, and the field has offered a means of living to a larger number of men, the return showing an increase of over 300 miners.

Some important new discoveries were made toward the end of the year at Blister Hill, where the wash gave in some places from 1 to 3½ ounces to the load, and the new year has witnessed what probably will prove the most important find made so far—a new lead near the town of Clermont, which is now known as the Jubilee Lead and already supports a population of about 800 men. There is a belief, however, that the main lead has not been found yet, and it would therefore be hard to say at present to what extent the importance of the place may not be augmented in the future. Of course these new discoveries have had the effect of reducing the population on some of the old camps; but still Black Ridge, Miclere, and Macdonald's Flat are anything but deserted. The former place until lately has supported about 500 men, and what was a dense scrub a couple of years ago has been turned into a populous center. Miclere has been holding its own, although the prospecting party that is subsidized to some extent by the department has not met with any payable new ground. The deepest shaft at the end of the year was 205 feet, and five others exceeded 100 feet. There has been some revival at Copperfield, and some abandoned claims on the Star of Hope line of reef have been taken up in expectation of reducing machinery being erected. A couple of cyanide plants have been operating here on the accumulations of old tailings left years ago. Thus 692 ounces of gold were obtained from 2,100 tons of material put through.

A company has been subsidized by the department to ascertain the existence of a deep lead near Quarry Hill which the Government geologist is of opinion is likely to exist. At 210 feet and again at 250 feet small seams of coal were encountered. The supposed bottom was reached at 313 feet, and there has been no time as yet to ascertain its auriferous nature or otherwise. On the whole, the mining prospects at Peak Downs are brighter than they ever have been before, and if no rapid fortunes have been made there a good living can be made by industrious and careful men.

The report from the Etheridge Gold Field must be considered satisfactory when account is taken of the numerous disabilities this isolated district is subject to at present. The increase in output of 5,384 ounces speaks volumes for the enterprise and perseverance of its inhabitants, who, notwithstanding the absence of the assistance of outside capital and the enormous rates they have to pay for their requirements consequent on want of such means of communication as the majority of the gold fields enjoy, have seen their way to carry on their mines so successfully under the circumstances. On the other hand, the seasons have been anything but favorable to mining. Their extreme irregularity has operated against the efforts of small parties of miners by making it impossible to have their stone crushed for want of water, while again the other extreme of sudden and phenomenal falls of rain have

been the cause of carrying away dams that were reasonably expected to tide mill-owners over a dry season. I fail to see how this district can be possibly expected to take the position that its mineral wealth fully warrants until railway communication is established. If that is done, capital will not be slow in finding its way to a place where safe investment may be counted on if efficient and prudent management is intrusted with its expenditure. The distance to the nearest railway station is only 120 miles, over mostly level country and presenting but very few engineering difficulties.

The event of the year has been the discovery of the Green Hills diggings, which alone have furnished a respectable yield of gold in the shape of nuggets and "specks," mostly found on or near the surface, varying in weight from several ounces to 180 ounces. So far there are no indications that would warrant predicting permanency, but up to the present a number of men have done very well there, and no doubt others will be able to enjoy similar good luck for some time to come. Then there is also the chance of meeting with the lodes that have been parent to these erratic masses of the precious metal—a contingency that would considerably enhance the future prospects of the district.

In reviewing the operation all over the field it must be confessed that very little progress is in evidence, but there certainly has been no falling off either. One mill at Georgetown has been pretty fully at work during the year, and the prospects there were evidently sufficient to warrant the erection of another one close to it. The Donnybrook mill also ran full time until want of water forced its hanging up. The Lane's Creek battery could not be kept going by the public; hence the proprietary had to fill up the gaps of inactivity by raising parcels of stone from some of the old claims in the vicinity that are allowed to lie idle.

The Queenslander battery was removed to permanent water at the Delaney River, a locality where doubtlessly it should have been erected at the start. This mine appears to be so far one of the most important ones on the field, and probably will be heard of hereafter when properly opened out and developed. At Goldsmiths Creek the large reef of low-grade ore did not give sufficiently satisfactory returns to warrant going on with it at present, but no doubt the day will come when the results will be more favorable. The yield was not equivalent to such low-grade gold returning a profit. In the meanwhile the proprietors are raising stone from a couple of smaller reefs that have shown a very fair record in the past. Some important additions have been made to the machinery on the gold field, among which the addition of two new boilers to the battery at the Nil Desperandum, at Charleston, may be particularly mentioned.

The mills in some of the other camps were kept idle now and then, either through want of stone or water. Many men left for the Green Hills rush, and consequently no stone was raised in localities that mill owners had thought good enough to take their batteries to. The Upper Percy is practically left unoccupied at present, both mills having been removed, though at the lower part of the river a few claims remain at work. With an increase of depth in the workings, the proportion of copper in the lode contents increased at such a ratio that some of the gold obtained gave only an assay of 7s. 6d. per ounce. Another portion of the gold fields that suffered temporarily through the rush was Mount Hogan, though I think this is a locality that is bound to come to the fore some time or other, and is well worthy the attention of the bona fide investor. The working miner there has done more than his best, but want of means has rendered his hard efforts ineffective. It seems hardly credible that men wanting to raise stone 300 feet should have to work with three different windlasses from three different plats, but such has been the case here. Instances like this should go a long way to illustrate the pluck of our miners, and on the other hand the futility of sending a boy to do a man's work. This not unlikely is one of our thousands of reefs that could be worked at a profit aided by capital and system, instead of just affording a living to hard-working men.

Gilberton may be said to be left forsaken as far as reefing is concerned. However,

specimen gold continues to be found, and in this way one man is reported to have got £1,000 worth of "specks" there last year.

There is no prospect of much of a gold output from the Cumberland district in the near future, as the company have closed down their mine and sold the machinery.

The Durham also, probably one of the most important lines of reef, lies idle, awaiting better times, when intelligence and economy can be made to go hand in hand with the capitalist.

The Woolgar can hardly be said to have been worked of late in the sense of a gold field. In the off season men that make their living in other occupations have made the place their camping place, to spell their horses, and probably for other reasons, best known to themselves, have occupied themselves in getting such gold as was easily to be obtained. A battery is now on its way there, and I understand that a company has been formed to work some of the old abandoned claims. I am under the impression that all the necessary factors to place the Woolgar once more on the list of the important gold producers of the district are there, if sufficient means are forthcoming to work the mines bona fide, systematically, and economically.

As one of the principal calamities that has befallen the gold field during the year may be mentioned the washing away of the dam at the Big Reef, at Charleston, when thousands of tons of valuable tailings were carried away.

The gold-mining centers that are placed under the charge of the Herberton warden, viz, Mareeba, Clohesy, Russell and Russell Extended, Tate and Balcooma, have, with the exception of the latter, which is a new discovery, exhibited a falling off in productiveness during the year. Some of the workings that yielded fairly at first have proved only surface shows, presenting no indications that would warrant going any deeper at present. This is to be regretted, as capital was ready to be invested in at least one of these localities. There doubtless is a future for both the Russell and Towalla, but in the meanwhile the same element, viz, water, will retard progress in these two localities. What Towalla could well spare is sadly wanted at the Russell. In this latter place the extent of auriferous deposit, such as can only be worked advantageously by means of hydraulic sluicing, is very great; but the difficulties of procuring the large supply of water that this mode of mining is based on have not been overcome so far, notwithstanding that one party of men alone have cut nearly 50 miles of water races. There appears to be no chance of bringing in water by gravitation from a reasonable distance, and therefore, for a time at least, the chances of this place going ahead are not very great.

At Towalla, on the other hand, the reefs, though rather small are fairly rich, but the difficulties in working, on account of the influx of water, are considerable. Fortunately the mountainous nature of the country permits in many cases of the construction of adits, which, although perhaps the most desirable mode of draining a mine, are at the same time one of the most expensive ones as a start. The difficulties of bringing machinery to such almost inaccessible places have been very considerable, but may be said to be counterbalanced afterwards to some extent by the advantage of being able to utilize the flow of water as motive power. I understand that similar auriferous terraces to these at the Russell River exist in a locality where a water supply could be procured from Lake Eacham. This is a magnificent reservoir of water, quite 200 acres in extent, without any outlet and without any drainage area that could account for such an accumulation of water. The only time that bottom has been felt by sounding the line used exceeded 600 feet in length. The site of this lake is clearly of volcanic nature, and probably an extinct crater, with subterranean communication regulating the supply of water, as hitherto no change of level has been observable. This natural reservoir should supply an abundance of water for hydraulicking, and this is a matter that should be well worthy the attention of mining investors possessed of the necessary means.

At the Tate River the mining that has been done was more or less of a prospecting nature. Some good gold has been got, but nothing good enough so far to induce work on such a scale as might tempt a man to erect a mill within reach of the mines.

The discovery of auriferous reefs at Balcooma was made during the year, though alluvial gold had been taken from the gullies there many years ago. The gold-bearing country is reported to be identical with a dioritic dike, that can be traced for about 9 miles, varying in width from 100 yards to half a mile. A battery is in transit to the locality, so that before long it should be possible to form some idea of the value of this latest addition to our gold-producing areas.

Mining matters in those far-distant and isolated gold fields that are in charge of the warden at Cloncurry have been rather dull. There has been a small increase in the amount of gold won, viz, 1,466 ounces. The alluvial gold shows a falling off equal to 568 ounces, but in a district like the one under view anything like a correct estimate of this item is next to impossible.

Diggers will take their gold with them and frequently dispose of it in other districts, and hence the local bank purchases are sure to be below what actually has been obtained.

The yield from quartz, on the other hand—661 tons for 828 ounces—shows an increase of 641 ounces, which has been the largest for years, and must chiefly go to the credit of the Bower Bird gold field. The exceedingly dry season experienced has militated doubtlessly against alluvial mining to a great extent. Most of the gold obtained during the year came from the old workings, that have been a stand-by for years, and some very nice parcels indeed were got from the Fifteen-Mile Camp and Pumpkin Gully. The Top Camp contributed a nugget weighing close on 18 ounces, so the alluvial gold in this district is evidently anything but exhausted. In this locality the Cloncurry Prospecting Association have done some prospecting by sinking three 20-foot shafts, to ascertain a possible continuation of the old alluvial lead, but so far they have not been successful.

On the whole, want of water has been much against prospecting. On the Leichhardt, Sunday and Bora gullies were worked vigorously as long as the water lasted, while the Native Bee is considered to be worked out. The prospectors at Agate Downs had to postpone operations for want of water.

Dealing with the reefs, there can be very little doubt that many of those that lie abandoned at present could be made to yield profits under experienced management and with adequate plant. The Gilded Rose, that averaged over 1½ ounces of gold to the ton down to 200 feet, was thrown up as soon as the ore became difficult to treat in consequence of the appearance of pyrites. There is a lode at Bishops Creek going 18 pennyweights to the ton; but absence of local capital, I presume, is the cause of such a mine having to lie idle, as the expense of carting to a distant mill would be prohibitory.

The Lady Gertrude claim, on the Leichhardt, has been worked energetically, and is reported to show good prospects of keeping up its reputation for good returns. At Bower Bird only four claims were at work at the end of the year, all on the Victoria line, the others being either under exemptions or abandoned for other shows. The P. C. workings consist of an open cutting 20 feet at its extreme depth, and the stone raised has been equal to 23 pennyweights of gold. The Block claim has been tested to 110 feet, but the water has been found more than what the men could overcome by the windlass. The Minister has decided to assist here toward some little pumping machinery, which probably will be equal to dealing with the whole of the water on this line of reef. Of course many of the men on these new findings are only diggers pure and simple, but not miners in the proper sense of the word, and the fact that reefs opened don't turn out payable in many cases may be set down frequently to want of knowledge and experience.

The want of anything like fair means of communication and of outside capital to give the place a fair trial acts detrimentally to the development of this district.

The cyanide plant erected during the year is idle for the present, as its capacity—30 tons per week—was not equal to being remunerative; but the works are likely to be enlarged in the near future.

I regret to say that there has been no advance in Ravenswood mining as such,

notwithstanding a slight improvement in output. The returns show 17,077 tons of material as having been operated on, and the gold obtained is given as 14,964 ounces, of which 1,519 ounces were alluvial. Three of the leading mines—the Grant, the Sunset, and the Old Man—have been idle for the greater part of the year for want of capital to carry on with, and this fact alone, in such a small community, had the unavoidable effect of causing much depression. Such a state of affairs of necessity always paralyzes the development of many of the smaller ventures on a gold field, as it lessens the number of backers. Of the larger mines the John Bull, at Evlinton, the New England No. 1 South, and the Hadleigh Castle, at Rochford, were the only ones that have been worked energetically, and the expenditure in connection with these and exploratory work in the Yellow Jack and a few other mining ventures have been a great assistance toward what may be perhaps termed "keeping the pot boiling."

In some of the smaller mines the results have been fairly satisfactory; but still I fail to see the attractions that this gold field can hold out at present to work such refractory ore as is found here on a small scale. If the ore can be raised in the most economic way—a supposition that is equivalent to carrying on operations on a big scale—with efficient management and adequate capital, and if the gold can be extracted from its combinations without the excessive loss that we are told is rather the rule at present than the exception, then Ravenswood must become one of the most important mining centers in the colony once more. That the smelting of these ores is the only satisfactory mode of treatment appears to be the opinion of the majority of those men that can give an opinion worth having on this subject, and that is one that was first pronounced more than twenty years ago. The most serious obstacle in connection with this is the distance of efficient smelting works that are at the service of the miner in this and the adjacent colonies, and the consequent heavy item of transport of the material to be operated on.

As to smelting locally, the output of ore at Ravenswood would have to be increased considerably before it could keep even moderate works in full work during one month out of the twelve, and such a supposition may be discarded, therefore, at once, at any rate for the time being. If some of the larger mines had the capital to increase their output to such extent as would warrant their erecting suitable concentrating plants, and then ship their concentrates to the Illawarra or Aldershot works, the true merits of this gold field might be determined practically with certainty, and these would be a guide to the mine owners in general. If there was anything like a certainty that the necessary ore would be raised to keep a mill with modern concentrating appliances fully employed, I have no doubt whatever that private enterprise would speedily supply the want. The suggestion that Government should erect a mill does appear hardly fair to my mind, for if such an enterprise does not give promise of paying the private individual it would be assuredly a failure in the hands of the Government. However, it has been argued that such a step should be taken, quoting the assistance given sugar mills as an analogous case. But in the latter case land that always must be of more or less value is pledged as a security, while a claim or lease that is found to be nonpayable is abandoned, and in many instances forever. The present "from hand-to-mouth" working never would send Ravenswood ahead, and the future of this gold field can only be looked forward to in bona fide mining with sufficient capital at its back.

The most important of the small gold fields in the Burnett district is undoubtedly Eidsvold, which shows an increase in the yield of gold for the year of 1,116 ounces. Some very good crushings have been recorded—as, for instance, from the Lady Augusta, which throughout the year has yielded over 5 ounces to the ton. The Stockman Extended also put through 18 tons for 139 ounces. However, there has been a decrease in the general average all over the field amounting to 5 pennyweights to the ton. The stone raised totaled 4,008 tons, yielding 5,835 ounces of gold, the outcome of the work of 142 miners. At St. Johns Creek there was a decrease of 107 ounces. Calls amounted to £4,475, while dividends only totaled £900. The future

of this place depends at present to a great extent on the success of the Empress meeting with the Lady Augusta Reef in their crosscut, and on the results of further sinking in the Minerva Leasehold. I fancy that a little more prudence in the management of the local companies would lead to better results. Good and effective management requires a certain amount of available capital at its back, and such a state of affairs can hardly be expected when a dividend is declared one day and a call made the next.

At Paradise work was more or less confined to prospecting the old lines of reef in the hope of getting on to richer stone. The crushings raised by about fifty men were only 915 tons, which yielded 985 ounces of gold. A cyanide plant was erected during the year; but this, I understand, did not give encouraging results.

The machinery that was at Mount Steadman has been removed, and every stone raised there at present has therefore to be carted 14 miles to Paradise. There were only 3 miners left in this camp at the end of the year.

Mount Shamrock is likely to be worked again on account of the owner himself in the future and on a larger scale than hitherto. Tributors raised 61 tons, which, after treatment at Aldershot works, produced 320 ounces of gold. A great number of small but rich veins seem to exist in this claim, and worked on a larger scale than has been the case of late should give a chance of encountering the gold-bearing shoots and extracting the metal at a good profit.

The ores produced in the Tenningering district are all of a very refractory nature, and can only be dealt with satisfactorily so far at the Aldershot works. At Reids Creek the output was 80 tons of stone, which were raised with a view of testing the financial prospects of the undertaking after local concentration and final treatment at the smelting works had been resorted to.

Sixty-four tons of stone from Mount Normanby yielded 116 ounces of gold at Aldershot, being the product of 3 men's labor.

In the neighborhood of Boolbunda about 70 men have found employment. Some very fair alluvial returns have been obtained here from freeholds, amounting to over 500 ounces. The stone from this locality returned at Aldershot 690 ounces of gold. Some parcels of this topped 5 ounces to the ton.

In the Mackay district the only mines requiring notice are the Zelma, at Grass-tree, and a couple of claims at Eungella. The former put out 690 tons of stone for 65 ounces of gold, after which it was hung up for a reconstruction in the proprietary. There is an immense accumulation of auriferous deposit to work out here, which can be inexpensively mined, and if judiciously worked should, notwithstanding of its low gold contents, show fair profits.

The prospects of the claims at Eungella are reported to be good, and having in one case water power for a motor, should show a fair record at the end of this year. A number of prospecting areas have lately been taken out at Bee Creek, a tributary of the Bowen River, where gold-bearing reefs are said to exist, and also at the back of Eaton, where a number of leaders carrying gold have been met with.

At the Normanby the little gold obtained came principally from a couple of claims, and the remainder from fossicking in abandoned mines. The whole output is set down at 102 ounces from 121 tons of stone, and also 289 ounces from alluvial. The Victor Tunnel has been abandoned, and the Grace Darling has been simply held by the men in charge of the machinery and those employed in getting firewood. There are no indications of a revival of mining here in the immediate future, though there are lines of reef that should be well worthy of being tested more systematically than has been the case hitherto.

The discovery of gold on Horn Island, near Cape York, has proved of no importance. The small alluvial deposits were very soon exhausted, and the reef stone raised during the year, 1,311 tons, yielded only 1,292 ounces of low-grade gold, the latter being only 0.676 standard. This result left no margin for profit over the expenditure incurred in mining and milling. About 1,000 tons of stone is left at grass. If the statement made that "mineralized" stone is available in quantities,

the shipping facilities existing here may make profitable mining yet possible by concentrating the auriferous combinations and sending them for final treatment to smelting works.

The dry season has affected the Mulgrave gold field in so far that the batteries that depend on water for motive power have had to hang up.

The Walter Hodson has completed, after a hard struggle, the erection of its 10-stamp battery, which should be in working order by this time, and should prove ere long the merits of the reefs in the locality. Never before in the mining history of this colony has the procuring of a crushing plant been beset with so many difficulties as has been the case in this instance, and the proprietary certainly deserve any success that may fall to its share. The workings in this mine in the form of levels, drives, etc., represent quite 1,000 feet already, and are so far down as 300 feet on a reef averaging from 18 to 24 inches. The Orient Reef also is a large one of low-grade ore, but should prove remunerative where water power can be made available in the reduction of the ore. I can not get a reliable estimate of the alluvial gold that has been obtained here, being mostly got on Russell Falls, and in all probability is disposed of in that locality. A cyanide plant, I understand, is contemplated for the working of the tailings accumulated on the banks of the Mulgrave River. Many of the men in this district have left for New Guinea, and mining therefore has not progressed as it might have done otherwise.

What is known as the Warwick gold fields—that is to say, Talgai, Thanes Creek, and Leyburn—have not made any appreciable advance, as may be seen from the output, which is given at 229½ tons of stone for 149 ounces of gold and 582 ounces from the alluvial workings. The industry here is in the hands of men who to a great extent combine mining with agricultural pursuits, and it may be presumed naturally that the best attention is given for the time to the calling that holds out the better returns. As a rule the reefs are not very large, running from 8 to 18 inches, but have not been tested to a much greater depth than something over 200 feet vertically.

There is a great clamor for the assistance of capital and for suitable reduction works here, but unless local enterprise steps in and proves the capacity of these mines to produce ore in sufficient quantities to keep works of the kind suggested profitably in full swing, the capitalist can hardly be blamed for holding aloof. If these mines are as good as they are expected to be by the owners, their development should add a great factor to the prosperity of this particular district, but local people must show their faith in them first by finding the means of opening them up to such an extent as will inspire the distant investor somewhat with confidence as to future results.

At Pikedale the principal gold mine working is the Kaffir Chief, which is engaged at present in further sinking, and hence there has been no output. This mine receives Government assistance toward being sunk another 100 feet from the 180 feet already attained. Other mines there, such as the Rise and Shine and the Homeward Bound, can not be said to have been worked vigorously during the year, and have not contributed toward our gold output in any way to my knowledge.

Mining operations in the Cooktown district can not by any means be reported to have been flourishing. Reefing was confined to Cocoa Creek, but with poor success. An additional 120 feet were driven in the First Call mine, but the result has been only something under 40 ounces of gold. The inability of coping with the heavy influx of water has stopped operations there altogether for the time. Some payable gold was found during the year near the mouth of the Stareke River, and the discovery attracted a number of men, the majority of which, however, were not miners. The gold sold from there was 364 ounces and represented the earnings of about 60 men or more. A good fall of rain would probably permit of better returns.

There has been some material progress made on the Coen gold field of late; 1,942 tons of stone passed the stampers for 4,303 ounces of gold. To this must be added 550 ounces of alluvial gold. The reefs discovered some time ago on the Nisbit

River, about 9 miles north from the rocky alluvial workings, contributed 85 tons for 283 ounces. A cyanide plant is in the course of erection, and should render a good account of the residues of former operations.

Another group of reefs has also been discovered about 7 miles southerly from the Coen, where nine claims besides the Reward claim have been taken up. The principal gold producers were the Great Northern, with 1,968 ounces from 520 tons, and the Trafalgar, with 203 tons for 678 ounces. There appears to be a good deal of tunneling ground on this gold field, and a number of claims have been taken up under this form of gold-field tenure. The Reward claim has produced 232 tons of quartz that yielded 224 ounces of gold, and therefore is, in a measure, a record under this clause of the regulations. Yet however useful the clause providing for tunneling claims may have been in the past for the purpose of monopolizing a maximum area of ground with the minimum number of men employed (usually one man holding the authorized 96 acres), I have never previously heard of any appreciable yield of gold from such holdings.

The people on this gold field appear to be of an enterprising and pushing disposition, and doubtlessly will satisfactorily develop the natural resources at their command. The alluvial workings at the Rocky are almost deserted.

The only discovery on the Palmer has been the finding of a hitherto unknown reef about a mile and a half distant from Maytown, varying from 6 to 18 inches in diameter, the workings of which so far has resulted in 34 tons of quartz for 327 ounces of gold, worth over £4 per ounce. Judging from the mint value of the gold, this reef may be assumed to have been one of the sources to which the alluvial gold obtained in the gullies and the flats about the Lonisa may be reasonably assigned. I may say here that in almost all instances the assay value of the reef gold obtained at the Palmer from reefs has been below that of all the 53 tons of alluvial gold that have been taken from the gullies, flats, and water courses, and the source of the former, therefore, must reasonably be looked for in formations removed by denudation in past ages.

The operations carried on during the year have been confined to working abandoned shows and alluvial. Five hundred and fifty-three tons of stone show a yield of 1,070 ounces, whilst the latter item furnished, as far as the acting warden could trace, 1,251 ounces of gold. It must be a matter of regret that no attempt whatever should have been made of late years to work at least some of the lines of reef that have had such a good record in the past. From the nature of the country rock, much water must be expected to be met with until the water level—that is, the tight country—has been reached, and mining under such conditions is naturally expensive, and requires powerful machinery at comparatively shallow depths, and the necessary capital at the back to carry on mining in a workmanlike way. That all these things will come to the Palmer some of these days need not be doubted, but in a place situated so out of the way it would be hazardous to venture on predictions when such a consummation may eventuate.

At Limestone the only mining done may be said to have been confined to the Anglo-Saxon Reef, and the property of the North Cross Gold Mining Company, the shares of which are principally held in Cooktown. The output has been 952 tons of stone, yielding 1,480 ounces of gold and 580 ounces alluvial. The former is the result of the labors of about twenty miners, principally tributors in the Anglo-Saxon, and the latter of about one hundred Chinamen. In the Anglo-Saxon a level was driven at 500 feet, for 110 feet, on a large reef (8 feet thick), but yielding only one-half ounce, which was not considered payable. A reef of similar size was met with at the 630-foot level, and the company propose to drive on this for 400 feet to determine its nature.

The Gladstone gold fields, which comprise Monal, Mount Rainbow, Barmundoo, Cania, Eastern Boyne, Sneakers, Raglan, and Calliope, and other minor camps, and which have given employment to about 350 men during the year, show a falling off in yield of gold from stone of 343 ounces and of about 500 ounces in alluvial gold. The extremely dry season made alluvial mining in many localities a sheer impossi-

bility, while on the other hand many of the diggers were attracted for a time by the employment obtainable in the district in connection with railway construction. I am not aware of any mines opened that would be likely—at any rate, for the present—to be worked on an extensive scale, but there are doubtlessly numerous localities here where diggers can do very well for themselves by working the ground in their own orthodox fashion. The output of ore from the reefs and the opening up of ground has been so far on altogether too small a scale to warrant an opinion on their ultimate prospects or a large outlay in development, though the return for the year—2,027 tons for 1,998 ounces—certainly speaks very well for the quality of the stone. As a rule the ore is of a very refractory nature, and the gold contents can not be extracted by the ordinary mill process. Carriage to efficient smelting works is naturally a very heavy item to be taken into account, while the other alternative, smelting on the spot, need not be considered for one moment seriously in connection with the present or immediate output in the future.

Mount Rainbow has undoubtedly been the most go-ahead mining center for the year, as far as progress is concerned, having contributed 1,102 ounces of gold from 817 tons of quartz. The returns from the Barmundoo district, which includes the camps on the table-land, show over 2 ounces to the ton, but the difficulties that beset the extraction of gold there has been a great drawback to extensive mining, and many of the claims have been allowed to be idle. Monal shows the largest output, with something over 2,000 tons, yielding within a fraction of 1 ounce to the ton. There seems to be little doubt that with combination of adjoining claims, which would justify the employment of steam power in place of the obsolete mechanical appliances now in use, much more satisfactory results could be obtained in the future. I also may draw attention here to the fact that during the year one party of men made £1 a day per man in working alluvial ground, and such an occurrence, in a district that has been mined in for so many years as this, permits not unreasonably of the supposition that many other such deposits do exist and only await discovery. The completion of the railway from Bundaberg to Gladstone should benefit these gold fields to a great extent by making them more accessible and at a much smaller expense, and probably make them a point of attraction to miners with limited means who at present simply waste their time in the vicinity of the metropolis and other places looking for what they are not likely to find.

The returns from the Hodgkinson show 2,762 tons of quartz for 2,791 ounces of gold, a result which must be considered satisfactory when it is borne in mind that the total number of miners was only 100 and that many of these were employed in purely prospecting operations. This gold field is attracting at last the attention of people at a distance, and a number of leases have been applied for here of late. The thorough testing of the reefs, if only even at a moderate depth for a beginning, should lead to satisfactory results in the case of a mining district with such a record as the Hodgkinson can show. The season has been a very unfavorable one, as want of water has made crushing in some localities an impossibility, and even want of a supply for domestic purposes has driven miners from their claims. One new line of reef that has given very fair results has been added during the year to the long list of others discovered previously. The principal center of activity has been around Kingsborough, where a goodly number of paddocks of stone await reduction. I am looking forward to this long-discovered gold field adding largely in the future to the gold productions of the colony, providing always that the areas now applied for will be systematically worked and with adequate capital. However, I trust that the adventurous speculator, without means of his own and without any particular mining experience, whose principal object is to make money out of floating companies, will give the district a wide berth, and not burden it with inevitable disaster and a bad name for the future, as unfortunately has been the case in so many other instances in the past. I am constrained to say that the statements frequently made anent the capital at command and other particulars stated when applying for exemptions from labor conditions from the start only too frequently have proved what may be termed, for convenience' sake, "fairy tales."

PARTICULARS OF THE PRODUCTION OF GOLD IN NEW SOUTH WALES IN 1896.[1]

Although there is apparently an increase of 773 men employed in the gold-mining industry, it is to be regretted that the output of the precious metal has not risen proportionately. As will be seen from the table following, there has been a decrease of 64,094 ounces and £242,569 in value as compared with 1895. As is stated elsewhere, this is traceable to the recent excessive drought and to the reduction in the output from the Lucknow mines. The mines at Hillgrove and Wyalong have largely increased their yield during the year, and with the many improvements being made in the gold-saving machinery on the mines throughout the colony the reduction is not likely to continue. The employment of suitable machinery in the treatment of our ores has been responsible for many of the failures witnessed in past years; but it is confidently asserted that with such improved appliances as will enable us to avoid the sinful waste of the past, gold-mining will become, as it ought to be, one of the leading industries of New South Wales.

QUANTITY AND VALUE OF GOLD WON IN THE COLONY OF NEW SOUTH WALES FROM 1851 TO 1896.

Year.	Quantity.	Value.			Year.	Quantity.	Value.		
	Ounces.	£	*s.*	*d.*		*Ounces.*	£	*s.*	*d.*
1851	144,120	468,336	0	0	1875	230,882	877,693	18	0
1852	818,751	2,660,946	0	0	1876	167,411	613,190	7	9
1853	548,052	1,781,172	0	0	1877	124,110	471,418	4	4
1854	237,910	773,209	0	0	1878	119,665	430,033	2	7
1855	171,367	654,594	0	0	1879	109,649	407,218	13	5
1856	184,600	689,174	0	0	1880	118,600	441,543	7	7
1857	175,949	674,477	0	0	1881	149,627	566,513	0	0
1858	286,798	1,104,174	12	2	1882	140,469	526,521	12	5
1859	329,363	1,259,127	7	10	1883	123,805	458,508	16	0
1860	384,053	1,465,372	19	9	1884	107,198	395,291	12	5
1861	465,685	1,806,171	10	8	1885	103,736	378,665	0	3
1862	640,622	2,467,779	16	1	1886	101,416	366,294	7	7
1863	466,111	1,796,170	4	0	1887	110,288	394,578	16	3
1864	340,267	1,304,926	7	11	1888	87,503	317,099	12	0
1865	320,316	1,231,242	17	7	1889	119,759	434,070	8	4
1866	290,014	1,116,403	14	5	1890	127,760	460,284	16	2
1867	271,886	1,053,578	2	11	1891	153,336	558,305	12	3
1868	255,662	994,665	0	5	1892	156,870	569,177	17	4
1869	251,491	974,148	13	4	1893	179,288	651,285	15	8
1870	240,858	931,016	8	6	1894	324,787	1,156,717	7	7
1871	323,609	1,250,484	15	11	1895	360,165	1,315,929	5	4
1872	425,129	1,643,581	16	11	1896	296,072	1,073,360	4	7
1873	361,784	1,395,175	8	7	Total	11,690,634	43,399,948	8	4
1874	270,823	1,040,328	13	6					

Owing to the numerous changes made by the public service board among the wardens and mining registrars during the latter part of the year, and the fact that those officers had barely time to make themselves sufficiently well acquainted with their districts to enable them to furnish their annual mining reports as complete as formerly, I regret that my notes on the gold-mining industry this year must necessarily lack many of the details given in previous reports. My object is to put the information in as concise a form as possible, and any noteworthy fact in connection with this very important industry is brought under notice.

[1] From the Annual Report of the Department of Mines and Agriculture, New South Wales, 1896.

I am indebted to J. MacDonald Cameron, esq., F. I. C., the deputy master of the royal mint, for the following information:

QUANTITIES OF GOLD, THE PRODUCE OF NEW SOUTH WALES, RECEIVED INTO THE ROYAL MINT, SYDNEY, DURING 1895 AND 1896, COMPARED.

District and division.	1895.	1896.	Increase.	Decrease.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*
Bathurst:				
Bathurst	2,086.55	1,561.36	.....	525.19
Carcoar	5,624.86	3,031.49	.....	2,593.37
Orange	37,338.74	2,953.46	.....	34,385.28
Trunkey Creek	202.79	160.64	.....	42.15
Tuena	632.32	103.26	.....	529.06
Mount McDonald	324.62	293.02	.....	31.60
Tambaroora and Turon:				
Hill End	651.98	1,112.57	460.59	.....
Tambaroora	38.73	54.34	15.61	.....
Sofala	3,136.60	2,178.39	.....	958.21
Stony Creek	.....	.....	.....	.....
Mudgee:				
Mudgee	4,975.46	5,273.77	298.31	.....
Gulgong	.....	2,495.73	2,495.73	.....
Hargraves	.....	.....	.....	.....
Wellington	1,379.35	2,030.36	651.01	.....
Lachlan:				
Parkes	9,827.97	8,881.73	.....	946.24
Forbes	.....	13.35	13.35	.....
Grenfell	1,169.38	1,245.41	76.03	.....
Young	1,956.41	1,296.41	.....	660.00
Temora	3,891.26	624.82	.....	3,266.44
Albert: Wilcanna	1,421.42	1,137.67	.....	283.75
Southern:				
Goulburn	838.01	568.67	.....	269.34
Braidwood	2,597.21	3,226.81	629.60	.....
Bermagui	.....	.....	.....	.....
Araluen	.81	25.92	25.11	.....
Shoalhaven	418.51	.....	.....	418.51
Nerrigundah	451.73	463.60	11.87	.....
Tumut and Adelong:				
Adelong	201.36	176.82	.....	24.54
Tumut	356.38	375.89	19.51	.....
Cootamundra	644.06	37.42	.....	606.64
Tumbarumba	2,445.29	2,519.33	74.04	.....
Gundagai	1,936.44	2,402.36	465.92	.....
Cooma	1,273.80	1,082.35	.....	191.45
Kiandra	125.31	88.26	.....	37.05
Wagga Wagga	201.80	103.02	.....	98.78
Peel and Uralla:				
Armidale	406.00	9,866.82	9,460.82	.....
Rocky River	16.54	83.66	67.12	.....
Nundle	.....	11.70	11.70	.....
Tamworth	749.57	449.39	.....	300.18
Bingara	1,406.08	1,303.69	.....	102.39
Hunter and Macleay: Copeland	47.07	126.92	79.85	.....
Clarence and Richmond: Grafton	1,543.51	1,776.26	232.75	.....
New England: Tenterfield	2,240.87	2,392.83	151.96	.....
Mixed: Western, Northern, and Southern	42,682.38	34,342.73	.....	8,339.65
Localities unknown	67,075.86	107,463.96	40,388.10	.....
Total	202,317.03	203,336.19	55,628.98	54,609.82

QUANTITIES OF GOLD, THE PRODUCE OF NEW SOUTH WALES, ETC.—Continued.

SUMMARY.

District.	1895.	1896.
	Ounces.	*Ounces.*
Bathurst	46,209.88	8,103.23
Tambaroora and Turon	3,827.31	3,345.30
Mudgee	6,354.81	9,799.86
Lachlan	16,845.02	12,061.72
Albert	1,421.42	1,137.67
Southern	4,306.27	4,285.00
Temut and Adelong	7,184.44	6,785.45
Peel and Uralla	2,578.19	11,715.26
Hunter and Macleay	47.07	126.92
Clarence and Richmond	1,543.51	1,776.26
New England	2,240.87	2,392.83
Mixed—Western, Northern, and Southern	42,682.38	34,342.73
Localities unknown	67,075.86	107,463.96
Total	202,317.03	203,336.19

From the foregoing tables it will be seen that the quantity of gold sent to the mint in 1896 exceeds that sent in 1895 by 1,019 ounces. A satisfactory increase is noticeable from the Armidale division due to the mines at Hillgrove, but the reduced output from the Lucknow mine is very evident in the returns from Orange, which is less than the previous year by about 35,000 ounces.

The following table is compiled from information kindly furnished by the collector of customs:

	Quantity (ounces).	Value.
Gold	82,707	£283,093
Quartz, tailings, and pyrites ..... 22,400 packages..	26,010	97,541
Total	108,717	380,634

The system adopted by the department in arriving at the output of gold for the year is to add the quantity received at the royal mint to that exported through the customs, deducting, of course, the quantity exported by the mint which appears in the customs return. The following figures show how the yield for the year is arrived at:

	Ounces.	£	s.	d.
Gold exported in bars and dust	82,707	283,093	0	0
Gold exported in quartz and concentrates	26,010	97,541	0	0
Total	108,717	380,634	0	0
Gold received by the mint, the product of the colony	203,336.19	759,852	17	11
Total	312,053.19	1,140,486	17	11
Less the quantity exported by the mint through the customs	15,982	67,126	13	4
Estimated yield for 1896	296,071.19	1,073,360	4	7
Yield for the year 1895	360,165.45	1,315,929	5	4

Consequently there is a decrease of 64,094 ounces, and in value £242,569 0s. 9d., as compared with the previous year. Although every care is taken, it would be difficult to prevent certain quantities of gold from being sent out of the colony without being recorded, more especially when it is associated with other than auriferous ores and bullion. For instance, during the year the Proprietary Company, at Broken Hill, saved in connection with their silver-smelting operations, 4,389 ounces, and this is the only company on the Barrier who gave any return of gold saved.

RETURNS OF GOLD FOR 1896 FROM MINT AND MINING REGISTRARS COMPARED.

District.	Mint.	Mining registrars.	Excess.	Deficiency.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*
Barhurst	8,103.23	43,686	.....	35,582.77
Tambaroora and Turon	3,345.30	12,281	.....	8,935.70
Mudgee	9,799.86	28,925	.....	19,125.14
Lachlan	12,061.72	64,855	.....	52,793.28
Albert	1,137.67	6,323	.....	5,185.33
Southern	4,285	19,059	.....	14,774
Tumut and Adelong	6,785.45	16,157	.....	9,371.55
Peel and Uralla	11,715.26	54,003	.....	42,287.74
Hunter and Macleay	126.92	1,441	.....	1,314.08
Clarence and Richmond	1,776.26	6,092	.....	4,315.74
New England	2,392.83	6,360	.....	3,967.17
Cobar	.....	29,400	.....	29,400
Mixed—North, South, and West	34,342.73	.....	34,342.73	.....
Localities unknown	107,463.96	.....	107,463.96	.....
Total	203,336.19	288,582	141,806.69	227,052.50
Excess of returns from mining registrars over returns from mint	.....	.....	.....	85,245.81

Much difficulty is experienced by the mining registrars in obtaining complete and correct returns from lessees, claim holders, and others for the purpose of the above table, and the difficulty is greatly increased when dealing with the class of miners termed "fossickers," whose operations are spread over a large area and who dispose of their gold as it is won to the nearest storekeeper for rations. Large quantities of refractory auriferous ore from the Wyalong, Pambula, Orange, Cobar, Hillgrove, and Drake gold fields are sent out of the colony for treatment, the yield from which is included in the returns sent in by the mining registrars, but not in that from the mint. The difference of 85,246 ounces may partially be accounted for in this way. It is very gratifying to note, however, that the yield as shown by the mining registrars, viz, 288,582 ounces, is only 7,489 ounces less than the estimated total yield for the year, thus showing that these officers had exercised some care in the preparation of their returns. Owing to the numerous changes made by the public-service board, many of the registrars are new to the duties or unacquainted with the district they have been removed to; but it is hoped by the end of the forthcoming year they will be in a position to supply still further information, without which some of these tables must necessarily be incomplete.

MINING REGISTRARS' RETURNS OF GOLD FOR 1895 AND 1896 COMPARED.

District.	1895.	1896.	Increase.	Decrease.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*
Bathurst	99,632	43,686	.....	55,946
Tambaroora and Turon	10,856	12,281	1,425	.....
Mudgee	32,343	28,925	.....	3,418
Lachlan	52,583	64,855	12,272	.....
Albert	6,295	6,323	28	.....
Southern	18,799	19,059	260	.....
Tumut and Adelong	23,113	16,157	.....	6,956
Peel and Uralla	45,802	54,003	8,201	.....
Hunter and Maclcay	594	1,441	847	.....
Clarence and Richmond	8,256	6,092	.....	2,164
New England	7,358	6,360	.....	998
Cobar	12,769	29,400	16,631	.....
Total	318,400	288,582	39,664	69,482
Decrease in yield for 1896	.....	.....	.....	29,818

The foregoing table compares the returns from the mining registrars for the past two years and shows a decrease of 29,918 ounces on the returns for 1895.

COMPARATIVE STATEMENT OF AVERAGE YIELDS FROM ALLUVIAL MINES FOR 1895-96.

District.	1895.			1896.		
	Quantity.	Average per ton.	Yield of gold.	Quantity.	Average per ton.	Yield of gold.
	Loads.	*Dwt. gr.*	*Oz. dwt. gr.*	*Loads.*	*Dwt. gr.*	*Oz. dwt. gr.*
Bathurst	1,174	11 7	665 0 0	5,228	11 0	131 7 0
Lachlan	4,364	6 4	1,354 7 22	817	4 12	184 6 0
Tumut and Adelong	200	1 12	15 0 0	120,524	0 6	1,465 13 0
Southern	500	3 14	90 0 0	350	0 9	6 11 22
Hunter and Macleay	640	1 0	32 0 0	.....	.....	.....
Mudgee	.....	.....	.....	1,560	3 0	234 0 0
Peel and Uralla	.....	.....	.....	1,500	0 5	16 0 0
Total	6,878	6 5	2,156 7 22	129,979	0 7.5	2,037 17 22

NOTE.—The above table only shows the yield where the quantity of stuff treated is ascertainable.

Without full and correct data a table such as the foregoing is almost worthless for the purpose of comparison, and it can be seen at a glance that the information supplied is not as complete as it should be. It is freely admitted that the mining registrars experience much difficulty in obtaining the necessary particulars regarding our alluvial mines, as in many cases no account is kept either of the dirt treated or the gold won. When the ground is worked by sluicing, it would be almost impossible to get at the exact quantity of alluvium put through, but when the ordinary method of washing is resorted to, with very little trouble the miners could assist the department greatly in this respect. The opinion prevails among the miners that the public have no right to know the result of their private operations; but when the benefit that reliable information of this nature would be to the mining community is considered, it might be said with truth that the opinion is an erroneous one.

COMPARATIVE STATEMENT OF AVERAGE YIELDS FROM QUARTZ MINES FOR 1895-96.

District.	1895.				1896.			
	Quantity.	Average per ton.		Yield of gold.	Quantity.	Average per ton.		Yield of gold.
	Tons.	*Oz. dwt. gr.*		*Oz. dwt.*	*Tons.*	*Oz. dwt. gr.*		*Oz. dwt. gr.*
Bathurst	17,541	4 15 17		83,958 10	18,237	1 13 15		30,301 7 15
Tambaroora and Turon	3,784	14 12		2,749 6	4,232	6		2,892 13 3
Lachlan	19,223	1 8 7		27,202 0	36,787	1 6 6		48,286 4 20
Southern	6,007	10 21		3,278 14	17,025	6 9		5,446 3 17
Tumut and Adelong	5,488	18 23		5,210 1	6,160	8 12		2,626 12 14
Peel and Uralla	43,137	13 9		28,878 12	47,551	14 11		34,388 10 0
Hunter and Macleay	449	14 23		336 0	470	17 0		401 10 0
Clarence and Richmond	3,068	17 7		2,652 18	1,729	17 17		1,539 11 0
Mudgee	15,088	12 7		9,169 19	21,399	12 11		13,319 10 0
Cobar	12,507	10 13		6,601 10	3,129	9 17		1,541 11 0
New England	2,139	1 15 5		3,769 0	2,119	9 14		1,018 17 0
Total	128,431	1 7 1		173,806 10	158,838	17 20		141,762 10 21

NOTE.—This table only shows the yield of gold where the quantity of stone treated can be ascertained.

The foregoing table, showing the average yield from our quartz mines for the year, gives rather more information than usual, and we are able to compare the returns from 158,838 tons of stone treated. The reduction in the total average yield is accounted for by the rich stone raised in 1895 from the Lucknow mine, in the Bathurst mining district.

It is gratifying to be able to point to an improvement in the completeness of the data supplied regarding the quartz mines, but there is still much left to be desired. Instances occurred during the year where the mine owners declined to give the figures. This is to be regretted, as a complete and reliable table of this nature would prove of the greatest benefit and interest to those engaged in mining throughout the colony.

Battery owners who crush for the public could assist the mining registrars immensely in obtaining the desired result, as they are compelled to keep some record of their operations, and it is to be hoped that they will see their way to assist in this matter.

The number of miners employed in gold mining during the year were 12,069 in reefing, 9,428 Europeans and 710 Chinese in alluvial workings, making a total of 22,207 men, an increase of 773 on the number so employed during 1895. A reduction occurs of 1,193 Europeans and Chinese on the alluvial fields, but there is an increase of 1,960 in the number of quartz miners at work.

Taking the quantity of gold won during the year, viz., 296,071 ounces, and dividing it by the number of men employed, it is found that the average earnings of each man was 13 ounces 6 pennyweights 15.5 grains, valued at about £51 13s. 3d.

It must be borne in mind in regard to these estimates of earnings that a large number of the men do not work as miners all the year around. Many of the men, more especially the alluvial workers, combine farming shearing, etc., with their mining operations as opportunity offers, or when water becomes too scarce in the creeks. The figures can therefore be taken only as a rough approximation of the actual earnings of each man employed, but they are sufficient to show that with ordinary energy a man settling on one of our gold fields can at least make a living, with the ever-present prospects of striking something richer than usual.

PARTICULARS OF THE YIELD OF GOLD IN VICTORIA IN 1895.[1]

Hitherto the department has depended solely on the mining registrars' returns for the purpose of showing the output of gold in the colony each year; but as such informa-

[1] Extract from Annual Report of the Secretary for Mines and Water Supply, Victoria, 1896, pp. 8-10.

tion as supplied by those officers has been found to be incomplete in comparison with the mint returns, a new and more accurate formulæ has been adopted for the estimation of the gold yield. In the compilation of their returns the officers mentioned have to depend chiefly upon the statements received from the banks and gold buyers as to the quantities of gold sold in their divisions. By following such a course a certain amount of gold is necessarily lost sight of, as miners very frequently send their gold direct to the mint. The figures furnished by the registrars are, however, useful in indicating, as far as they are able to procure statistics, the various localities in which the gold has been obtained.

The yield for the past year, in accordance with the system which now obtains for calculating the same (the data for which will be found on referring to statement No. 1), was 740,086 ounces 3 pennyweights 9 grains.

In order to form a fair comparison between the product of 1895 and the previous twelve months, the yield (716,954 ounces 14 pennyweights 11 grains) for the latter period has been computed in the same manner, thus showing an increase of 23,131 ounces 8 pennyweights 22 grains in favor of the year 1895.

The yield of gold, according to the returns received by the mining registrars for the year ended the 31st of December, 1895, amounted to 693,837 ounces 6 pennyweights 15 grains. The return from alluvial workings was 270,903 ounces 5 pennyweights 17 grains, and from quartz 413,934 ounces 10 pennyweights 22 grains were obtained. An increase of 25,594 ounces 14 pennyweights 1 grain has been recorded for alluvial as against a decrease of 5,437 ounces 8 pennyweights 9 grains for quartz. The return reported for each district was as follows:

District.	Alluvial.			Quartz.			Total.		
	Oz.	*dwt.*	*gr.*	*Oz.*	*dwt.*	*gr.*	*Oz.*	*dwt.*	*gr.*
Ararat	16,948	7	8	15,103	14	22	32,052	2	6
Ballarat	75,584	9	12	90,631	8	2	166,215	17	14
Beechworth	70,049	12	17	26,360	1	13	96,409	14	6
Castlemaine	35,589	14	2	30,498	4	3	66,087	18	5
Gippsland	19,831	3	4	72,449	15	10	92,280	18	14
Maryborough	56,410	0	2	24,966	1	0	81,376	1	2
Sandhurst	5,489	18	20	153,924	15	20	159,414	14	16

Statement No. 2, at page 80, shows the yield from alluvial and quartz for each division of the mining districts, and statement No. 3 is the record of the gold yield for each year since the first discovery to the present time.

The total yield from crushings of quartz, as stated above, was 413,934 ounces 22 grains. By the subjoined statement it will be seen that the mining registrars were furnished with returns showing that 855,736 tons were crushed for 368,035 ounces 5 pennyweights 18 grains of gold, giving an average of 8 pennyweights 14 grains per ton for the whole colony. The following were the quantities of quartz treated, the yield of gold therefrom, and the average per ton in each mining district:

District.	Quantity treated.	Yield of gold.			Average per ton.		
	Tons.	*Oz.*	*dwt.*	*gr.*	*Oz.*	*dwt.*	*gr.*
Sandhurst	380,733	144,851	18	18		7	14
Ballarat	271,280	83,828	9	12		6	4
Gippsland	54,491	54,543	7	3	1	0	0
Castlemaine	48,400	31,233	3	1		12	21
Maryborough	43,870	18,922	19	9		8	15
Ararat	31,445	12,233	13	17		7	18
Beechworth	25,517	22,421	14	6		17	13
Total	855,736	368,035	5	18			

Several individual crushings gave very high averages, among which were—

Operator.	Amount crushed.		Yield.			Average per ton.		
	Tons.	*cwt.*	*Oz.*	*dwt.*	*gr.*	*Oz.*	*dwt.*	*gr.*
Mac's Lucky Co., Rokewood	0	1	51	16	12	1,036	10	0
The Lone Hand Co., Wood's Point	0	1	15	6	0	306	0	0
McLaughlin & Co., Glenpatrick	0	2	27	2	12	271	5	0
Shaw & Co., Wedderburn	8	0	607	15	0	75	19	9
Lucas & Co., Sheep Station Creek, Omeo	12½	0	292	8	0	23	7	20
Homeward Bound Co., Queenstown	5	0	114	0	0	22	16	0
Hopkinson & Co., Queenstown	13	0	239	11	0	18	8	13
Bremer & Co., Maryborough	1	0	12	18	0	12	18	0
Highland Chief Co., Sheep Station Creek, Omeo	38	0	489	4	13	12	17	11
Scotchman's Co., Wehla	7	0	83	1	9	11	17	6
Ryan & Co., Corryong	3½	0	38	11	0	11	0	3
Masters & Co., Corryong	19	0	208	0	0	10	18	22
Blair Bros., Warrandyte	8	0	86	12	0	10	16	12
Grant & Co., Corryong	127½	0	1,180	12	0	9	5	4

The following were some of the most extensively worked during the year 1895 of the quartz mines, as evidenced by the quantity of gold obtained:

	Ounces.
Long Tunnel Company, Walhalla	20,783
Long Tunnel Extended Company, Walhalla	12,126
South German Company, Maldon	11,537
New Red White and Blue Company, Bendigo	10,635
Lord Nelson Company, St. Arnaud	10,471
Star of the East Company, Ballarat	9,532
Magdala-cum-Moonlight Company, Stawell	8,937
Lady Barkly Company, Bendigo	8,936
New Prince of Wales Company, Bendigo	7,[illegible]00
New Mariner's Company, Steiglitz	7,426
Last Chance United Company, Ballarat	7,128
Windmill Hill Company, Bendigo	6,968

In addition to the quartz crushed, pyrites to the extent of 5,181 tons were treated for a return of 12,497 ounces 14 pennyweights 10 grains of gold, the average per ton being 2 ounces 8 pennyweights 6 grains.

There were also treated 62,319 tons of tailings and mullock for a yield of 5,380 ounces 8 pennyweights 14 grains, averaging 1 pennyweight 17 grains per ton.

The quantity of gold obtained from alluvial workings, as estimated by the mining registrars, was 279,903 ounces 5 pennyweights 17 grains for 1895, as against 254,308 ounces 11 pennyweights 16 grains, the estimate of the amount won in 1894, thus showing an increase of 25,594 ounces 14 pennyweights 1 grain. Returns collected from the managers record the yield of gold as 111,014 ounces 1 pennyweight 5 grains from 1,398,084 tons of wash dirt treated, averaging per ton 1 pennyweight 11 grains. There were also 16,008 tons of cement crushed for 1,380 ounces 8 pennyweights, which gives an average of 1 pennyweight 17 grains per ton.

The following were the largest yielding alluvial mines during the year:

	Ounces.
Prentice Freehold Company, Rutherglen	16,704
Berry Consols Company, Smeaton	16,473
Madame Berry Company, Smeaton	14,839
North Duke Company, Timor	13,985
Chalk's No. 1 Company, Carisbrookm	10,143
Great Northern Extended Company, Rutherglen	9,685
Chiltern Valley No. 2 Company, Chiltern	9,316

On the 31st of December, 1895, nine mines were over 2,500 feet deep at Bendigo, and four were over 2,900 feet in depth, the deepest being Lansell's 180 mine, 3,302 feet, and the Lazarus Company, 3,024 feet, the former being the greatest depth yet reached in any mine in the colony. The following were the deepest mines on the other gold fields in Victoria:

	Feet.
Magdala-cum-Moonlight Company, Stawell	2,409
South Star Company, Ballarat	2,030
Homeward Bound Company, Beechworth	800
Great Southern Company, Rutherglen	322
Welcome Company, Alexandra	730
Hope Company, Woods Point	530
Ajax Company, Castlemaine	1,116
North Cornish Company, Daylesford	990
Derby Long Tunnel Company, Walhalla	1,936
New Blucher's Reef Company, Maryborough	786
Lord Nelson Company, St. Arnaud	1,220

STATISTICS.

Statement referred to above is as follows:

SHOWING THE YIELD OF GOLD IN VICTORIA FOR THE YEAR ENDED DECEMBER 31, 1895.

	Ozs.	dwt.	gr.
Victorian unminted gold received at the Melbourne mint during the year 1895	718,927	6	9
Difference in quantities of unminted Victorian gold held by the banks on the 31st December, 1894 (61,922 ounces 19 pennyweights 9 grains), and the same date of 1895 (83,064 ounces 0 pennyweights 9 grains), the difference being in favor of the latter it is consequently added to the mint return	21,141	1	0
Quantity of Victorian unminted gold purchased by the New South Wales mint during the year 1895	17	16	0
Total yield for year	740,086	3	9

PARTICULARS OF THE GOLD PRODUCTION OF NEW ZEALAND IN 1895.

GOLD MINING.

The steady returns from the leading mines have directed attention to the mineral resources of the colony, and a demand has set in for New Zealand mines as an investment for foreign capital. As a natural result, large areas of new ground and mining properties partially developed and then abandoned have been taken up, with the view of carrying on more extensive operations than formerly. Every encouragement in the matter of extended areas and security of title has been afforded to companies willing to carry on prospecting in a systematic manner; but, at the same time, safeguards have been provided to prevent large areas of mineral lands being held for purely speculative purposes. In past years many mining properties were abandoned and often unjustly condemned as worthless when only partially and imperfectly prospected, chiefly through an insufficiency of capital. During the present revival capital to prospect many of these properties, as well as new areas, will doubtless be forthcoming if the owners are fair and reasonable in their demands. With capital for development and the employment of new processes of treatment, gold mining is rapidly becoming a permanent industry of great value to the colony; and the constant care of the Government will be to foster its development in every legitimate way.

The quantity of gold entered for exportation through the customs for the year ending the 31st March last, as shown in Table No. 2 annexed, was 302,690 ounces, representing a value of £1,196,081, while the quantity exported for the same period of the preceding year was 222,981 ounces, valued at £889,545. This shows the substantial increase of 79,707 ounces, not including the gold manufactured into jewelry in the colony during that period. Of the quantity exported, Auckland contributed 117,029 ounces; Marlborough, 3,173 ounces; Nelson, 3,813 ounces; West Coast, 89,721 ounces, and Otago, 88,954 ounces. Auckland shows the largest increase, being 58,998 ounces, or more than double the quantity produced for the previous year. Of the total quantity of gold entered for exportation last year, Auckland contributed 38.67 per cent; Marlborough, 1.04 per cent; Nelson, 1.26 per cent; West Coast, 29.64 per cent, and Otago, 29.39 per cent.

QUARTZ WORKINGS.

This important branch of the gold-mining industry continues to make very steady and satisfactory progress, the returns of last year showing a very marked increase over those of the preceding year. The bulk of the increase has been from the mines in the North Island. During last year 127,572 tons of quartz and tailings were treated in the Auckland district, yielding 221,289 ounces of bullion, representing an estimated value of £378,107, as against bullion to the value of £261,746 for the former year, being an increase of £116,361, or 69 per cent increase for the year. In Nelson the number of tons of quartz and tailings crushed is not given in the battery returns, but the yield of gold for that district from quartz crushed was 225 ounces, valued at £866. On the west coast 31,986 tons of quartz and tailings were treated for a return of 17,794 ounces of gold, valued at (approximately) £60,080, and in Otago, 11,679 tons of quartz and tailings were treated for a return of 5,560 ounces of gold, having an estimated value of £21,545. The total quantity of quartz and tailings treated last year was 171,237 tons, which yielded gold and bullion to the value of about £468,958, as against £358,250 for the previous year. The yield last year from the quartz workings was equal to 47 per cent of the total value of the gold entered for exportation, compared with 40 per cent for the preceding year.

In the Hauraki gold fields the cyanide process is now very extensively used, and it is of great interest to state that no less than 71 per cent of the total production of the gold and bullion of those gold fields was extracted through the agency of that process. The extraction of bullion by the cyanide process last year was 52 per cent of the total value of the bullion obtained in this district. Judging from these figures, the time is not far distant when the process will be more generally adopted at the mines in the North Island. During the past few years the cyanide process in the hands of different metallurgists and engineers has made rapid strides, chiefly in the designing of plants and appliances to facilitate the handling of the ore and reducing the cost of treatment. The ordinary cyanide process is not suitable for the treatment of all classes of ore, more especially that containing base metallic substances, including copper compounds, but no doubt modifications and improvements will be found to overcome the difficulty, as a result of the researches now being conducted by different metallurgists and chemists.

COROMANDEL.

In this district the Hauraki mine still continues to be the chief gold producer. The monthly returns maintain a very high value, and prove the shot of gold on Legge's reef to be of great extent and exceptional richness. The Hauraki mine alone produced more than half the yield of gold from the Coromandel gold field during the past year just ended, and the rich returns from this mine have created a demand for properties in this field. A large number of mining properties have been acquired by English companies, and at the present time prospecting operations are being carried on over extensive areas of gold-bearing country. Judging from past results it is only reasonable to expect that many valuable finds will be made as operations proceed.

One of the principal features of the operations of the past year has been the deepening of the Kapanga shaft with the view of testing the ground at the lower levels. These operations having an important bearing on the solution of the problem of deep sinking in all parts of the Hauraki gold fields, they were aided by a small subsidy from the Government. I have much pleasure in stating that so far the results have been very satisfactory. The value to the field of the discovery of a rich vein of quartz at a depth of 930 feet can hardly be overestimated, affording, as it does, conclusive proof that gold exists at the low levels 200 feet deeper than the greatest depth reached at the Queen of Beauty shaft at the Thames, to which I shall refer presently. The results obtained at the Kapanga mine should afford encouragement to foreign companies who have purchased mines on which capital is to be expended in deep sinking.

At Kuaotunu the Kapai-Vermont mine has yielded payable returns throughout the year, and already several mines have been acquired by capitalists with the intention of extensive operations being undertaken. The chief drawback to this field is the scarcity of water for motive power, which makes the treatment of the ore more expensive than at the Thames.

In this district 18,034 tons of quartz and 8,830 tons of tailings were treated during the year, yielding 41,253 ounces and 3,534 ounces of gold, respectively, representing a value of £138,897, while 1,045 men were employed in the district in connection with the mines.

THAMES.

During the past year there was slight improvement in the returns from this field. Up to the present time systematic mining operations have been restricted to a very limited area, not exceeding 700 acres altogether, and the returns of gold have been phenomenal. The Thames gold field proper is divided into two unequal portions by the great Monanatairai Fault, which forms the northeast boundary of the drainage area. The area, on the seaward or hanging wall side of the fault, comprising some 200 acres, has yielded gold to the value of £4,500,000, of which nearly one-half has been paid in dividends. The whole of this large yield was obtained from the surface down to a depth of 500 feet, below which no systematic mining has yet been undertaken. Lately a number of mines have passed into the hands of English companies, and operations on a more extensive scale and at greater depths will soon be initiated.

The outlay of capital is fully warranted by the past results, and there is every reason to believe that large quantities of gold will be won from the deep levels. The company which has acquired the Queen of Beauty special claim has undertaken to erect machinery capable of pumping and winding to a depth of 2,000 feet, and in consideration of this the company will be aided by a Government subsidy at the rate of pound for pound up to the sum of £25,000. The specifications for the pumping plant, which is to be capable of lifting 2,000 gallons of water a minute from the depth to which the shaft is to be constructed, have been approved. The shaft will be a public shaft, from which other mining companies will be permitted to carry on their operations. The sinking of this shaft will prove an important factor in the development of the Thames gold field, as it will enable all the mines on the foreshore, or seaward side of the Moanatairai Fault, to conduct their operations at greater depths than formerly attained. When the Queen of Beauty shaft is clear of water to the bottom level, 748 feet deep, the adjoining mines, such as the May Queen, Saxon, Victoria, Hazelbank, and Moanatairai, will secure an additional 300 feet of backs on the existing reefs, after a drainage crosscut has been extended through the hard andesite bars in the Victoria and old Exchange leases to the bottom of the pumping shaft. As the sinking proceeds fresh areas of deep ground will be rendered available, and with the expenditure of capital and improved gold-saving appliances there should be a large increase in the gold returns from this field in a year or two.

During the past year 29,976 tons of quartz and 1,497 tons of mullock were crushed, yielding 23,043 ounces of gold, and 13,549 tons of tailings yielded 2,192 ounces of gold, representing an estimated value of £63,913. The number of men employed in the mines was 677.

OHINEMURI.

There has been a very marked increase both in the returns and number of men employed during the past year. The steady returns from the Waihi mine have proved the permanency and great value of such large ore bodies as the Martha lode, and have given English investors a confidence in the stability of these gold fields. Since the beginning of the year a number of properties have passed into the hands of foreign companies, and for some time to come considerable sums of money will be spent in opening out and developing the large bullion reefs in this field. At Waitekauri the Waitekauri Gold Mining Company have undertaken some extensive works to open up and render accessible the valuable Golden Cross reef, and a few months should see largely increased returns from their new battery. At Karangahake the operations of the New Zealand Crown and Woodstock companies have been carried on with much success, and, with the new stampers now being erected at each mine, there should be a corresponding increase in the value of the bullion returns. In the Ohinemuri gold fields dry crushing and cyanide treatment is universal. During the past year 45,284 tons of quartz yielded by amalgamation 1,915 ounces and by cyanide 121,284 ounces of bullion, while 11,724 tons of tailings gave a return of 23,887 ounces by cyanide and 415 ounces by amalgamation—making a total of 147,450 ounces of bullion, representing a value of £174,355, which is equal to about £1 3s. 7d. per ounce, as against 110,628 ounces of bullion, valued at £137,699, equal to £1 3s. 1d. per ounce for the previous year. During the year 1,724 men were employed in the mines compared with 538 for last year.

WAIORONGOMAI.

This gold field is traversed by a number of very large reefs, the average value of which is very low-grade. The successful working of these ore bodies will require the outlay of much capital in systematic development, and also for the erection of crushing machinery capable of treating large quantities of ore and at the same time extracting a fair percentage of the values. Much of the ore in these reefs is of a refractory character, containing finely divided gold, associated with or entangled in copper pyrites and silver sulphides. At Waiorongomai a wealthy English syndicate are about to commence extensive operations on the big reef, and should these be successful a large increase in the gold returns may be looked for.

The quantity of quartz crushed and treated during the past year was 120 tons, yielding 153 ounces of bullion, while 54 tons of tailings gave 15 ounces of bullion, representing a total value of £941. During the year 36 men were employed on this field.

WEST COAST.

Reefton is the principal quartz-reefing district on the west coast, and is at present attracting the attention of foreign capitalists who are taking up quartz-mining properties with the view of further developing them. A large amount of English capital has been already introduced into this district, and the best of the properties, as far as yet ascertained, have been purchased by the Goldfields Consolidated Company, represented here by Mr. Ziman. The introduction of large amounts of foreign capital will have the effect of the ground not only being worked at much greater depths than heretofore, but also of the mines being worked in a more systematic and economical manner. More modern machinery and appliances will be introduced and erected for the reduction and treatment of auriferous ores, and it is expected that a far larger percentage of the gold will be recovered.

The discovery of a new auriferous lode in the Keep It Dark mine at a depth of 850 feet has done a great deal toward inspiring confidence in searching for lodes containing rich stones at deeper levels than heretofore prospected; and now, when capital is forthcoming to develop the mines in this district, there is reason to believe that brighter days are in store for Reefton, and that it will become a very large and important mining center.

OTAGO.

The principal places in Otago where quartz workings are carried on are in Macetown and Skippers. At the former place a considerable quantity of gold has been obtained from the Tipperary, Maryborough, and Premier mines already, but it is to be regretted that the recent operations in these mines have not been attended with the success they deserved. The Tipperary, Premier, and Sunrise mines are the property of an English company which has expended a considerable capital to open them up more fully, and a large expenditure will yet have to be made before all the development works in progress will be completed and the mines opened out so as to get payable returns.

At Skippers, the Phœnix Company, which really meant Messrs. G. & F. Bullen's mine, is now taken over by the Achilles Company, which was formed in London, and large development works are being carried on to open up the mine extensively, and some good ore is in sight. This is the oldest quartz mine in Otago, having been opened in 1863, and has been almost continuously worked ever since.

A considerable amount of capital has also been expended in prospecting and development works in the Cromwell mine at New Bendigo without yet meeting with success; but where so large a quantity of gold was obtained on the upper levels as that found in this mine there is a reasonable prospect of another rich shoot of ore being found at the deeper levels.

At Preservation Inlet and Wilsons River the quartz workings are yet in their infancy. The lodes are not developed to such an extent as to justify a definite opinion regarding their value. Very rich stone was discovered in the Golden Site mine at Wilsons River, but this block cut suddenly out, and very little work has been done to ascertain whether it can be picked up again farther along the course of the lode or at a greater depth.

There are large quartz lodes in many places in Otago; but where gold has not been seen in the stone at the outcrop there has been no work done to ascertain whether a shoot of auriferous ore may be found at deeper levels or not, as for instance, on the range between the Clutha and Manuherikia rivers, the Old Man Range and the Rough Ridge. These places are all traversed by quartz lodes, where little or no work has been done to determine whether some of them may be payable for working or not.

ALLUVIAL MINING.

This branch of the mining industry is entirely confined to the Middle Island—in the Marlborough, Nelson, the West Coast, and Otago districts. The whole of the shallow, rich ground being worked out, attention had to be directed to the terraces and flats, where there are great depths of superincumbent gravels overlying the richer auriferous layers of wash drift which are found on both false bottoms and on the bed rock. The upper gravels generally carry very little gold, and have to be removed in the most economical manner before the richer deposits can be got at; and the cheapest method of doing this is by hydraulic sluicing, which requires an abundant water supply. The cost of constructing works to bring a water supply to command the ground is, in many instances, beyond the means of private individuals; and ground that otherwise could be worked remmneratively is left waiting for capital to bring in water to work it on a systematic and extensive scale.

MARLBOROUGH.

The principal fields where alluvial mining is carried on in the Marlborough district are Wakamarina, Mahakipawa, and the Wairau; but at none of these places is there a large mining population. The gorge workings at the Wakamarina are still in hand. Several companies have been formed to work this claim, but have failed. However, extensive preparations are again being made to bottom this gorge, where it is expected by some to find a large deposit of gold, while others are more incredulous and affirm that the labor will be wasted.

At Mahakipawa the shallow workings in the creek bed are a thing of the past, and attention is being directed to working the terraces and deep ground in the flat, where a rich lead of gold is said to pass through the King Solomon mine into Mr. Cullen's freehold. There is a large extent of country in the Marlborough district where little or no prospecting has yet been done, which, judging from the formation of the country, ought to contain auriferous gravels.

NELSON.

The principal gold field in the Nelson district is Collingwood. A large capital has been expended here recently by the Parapara Hydraulic Sluicing Company to work the Parapara flat, but so far a large amount of success has not attended their operations. There are, however, large quantities of auriferous drifts in this neighborhood, which it is expected will yield sufficient gold to recoup the outlay, which is set down at about £25,000.

Other companies are being formed to work the auriferous drifts in the quartz ranges and Golden Gully, where it is proposed to bring in a water supply from the Clarke River and also from the Bowlder Lake to carry on hydraulic operations. A considerable number of miners are scattered about in different gullies, and are said to be making fair wages. There are also a considerable number of miners engaged throughout the district of Anatoki, Kill-devil, Baton, Wangapeka, and the Crow diggings. The latter place is stated to contain large deposits of auriferous wash drifts; and on the strength of representations made to that effect a horse track was constructed from the Wangapeka Saddle to the head of the Crow River to enable the miners to get their supplies by pack horses, instead of having to carry everything themselves. The construction of this track, as well as a horse track from the Wangapeka Saddle toward Karamea, will open up a large extent of country covered with auriferous gravels, as well as land suitable for cultivation.

WEST COAST.

This is the largest and most extensive gold field in the colony. Gold to the value of £22,280,426 has been obtained from the west coast, and it still continues to produce about 30 per cent of the whole of the yield of gold in the colony. It would be superfluous for me to mention all the different gold bearing areas on the west coast gold fields, but generally it may be said they extend from Karamea to Jackson Bay, a distance of over 270 miles, the principal being at Addisons Flat, Grey Valley, Kumara, Rimu, and Ross.

At Addisons Flat the leads of gold-bearing gravels extend a long distance back from the coast line, and run parallel with the seabeach. Some very rich deposits of gold-bearing gravels have been found at different places on this flat; but the shallow and easily worked portions of the ground have for many years been worked out, and to carry on alluvial mining here now in the deep ground requires a good water supply and an extensive plant. The number of men who can be remuneratively employed on this flat is only limited to the supply of water that can be brought on to work the ground.

GREY VALLEY.

There are a large number of miners employed in different portions of the Grey Valley—at Antonio's, Blackwater, Noble's, Duffer's, Orwell Creek, Nelson Creek, No Town Creek, Moonlight, Blackball, as well as in several other places, in some of which extensive mining and sluicing operations are carried on. The great depths of auriferous gravels in such places as the Grey Valley, Napoleon Hill, and between Orwell and Nobles creeks, would give highly remunerative returns for working if a sufficient supply of water could be brought to command them.

On the north side of the Grey River there are large areas covered with auriferous drifts, generally of a more recent age than the gravels on the south side of that river, which give fair returns for working when water is available for hydraulic sluicing.

A great deal of these drifts contain large bowlders, which interfere to a great extent with the working of the ground, as at present all these bowlders are shifted by hand, no mechanical appliances being used to remove them; but no doubt, when attention is directed to this branch of the mining industry as an investment for capital, more modern systems of working will be adopted, and instead of having a number of small claims, larger areas of ground will be taken up, and capital will be forthcoming to construct water races so as to carry on hydraulic-sluicing operations extensively.

In the beginning of last year some good sluicing ground was taken up in the vicinity of Healy's Gully, and a water race from Roaring Meg Creek commenced, to bring a supply of water to work the ground. This caused attention to be directed to this place, with the result that a number of claims have now been taken up, and from the prospects obtained are likely to prove valuable properties. A subsidy has been granted toward the water race referred to, on condition that it is constructed of such dimensions that at least fifteen sluice heads of water will be available for working claims not directly interested in the race.

KUMARA.

This may be termed the most compact alluvial diggings in the colony. It is also the largest alluvial mining center. The ground at first was all held in small claims. A number of these have now, however, been worked out, and fresh claims taken up farther back near the base of Kapitea Hill. Gold to the value of nearly £1,500,000 has already been obtained from this field, where the worked-out ground does not exceed 600 acres in extent. There is a very large area of country in this neighborhood covered with auriferous drifts, which will in future years be worked, after the present claims have been exhausted and water has been made available. The auriferous drift being on a large wide flat extending back from the Teremakau River for about a mile, necessitates the construction of expensive tunnel tail races to convey the tailings to where they can be deposited. A large water supply having been brought in by the Government, facilities are given to the individual miners to work the ground on the hydraulic sluicing system, while the prices paid to the Government for the water leaves a fair rate on interest of the capital expended, as well as a sinking fund for the redemption of capital within a reasonable number of years.

Passing southward from Kumara, there is a large extent of country covered with auriferous drifts, especially between the Arahura and Hokitika rivers, known as the Humphreys Gully gravels. In some places the depths of these drifts are over 250 feet. Hydraulic sluicing has been carried on here for a number of years, but the supply of water brought on to work the ground was totally inadequate to carry on sluicing operations in a satisfactory manner. Recently an English company has purchased the water rights and property of the Humphreys Gully Company, and they intend bringing in a large supply of water from the Arahura River to work the ground on an extensive scale, whereby they hope to make it a remunerative property.

RIMU.

The workings here are carried on both by hydraulic sluicing and mining in the ordinary sense of the term. The greater portion of the population is engaged in driving out the ground from audit levels and shafts. There is a great depth of auriferous drift, but most of the gold is in layers or bands. The elevation of a large extent of the ground in this locality where most of the miners are employed precludes the possibility of water being brought in to work the ground by hydraulic sluicing at anything like a reasonable amount. At present this is by far beyond the means of the individual miner, but there is a good prospect of payable ventures being taken up here by a company or syndicate with sufficient capital to undertake the construction of a water race at a sufficient elevation to command the ground.

ROSS.

There are large deposits of auriferous gravels on both the terraces and flats in the vicinity of Ross. The terraces are worked by hydraulic sluicing wherever water is available; but on the flat the ground can only be worked from shafts and by the aid of heavy pumping appliances. On Ross flat eight different gold-bearing layers of gravel have been gone through and no main bottom or bed rock has yet been reached. Notwithstanding that, the workings have been carried down to a depth of over 200 feet below the level of the sea, still in auriferous drifts containing highly rounded pebbles and stones, indicating that the material has been at one time subjected to river action. A considerable quantity of gold was obtained in the early days from the deep workings on Ross flat, but the drainage plant used was not of sufficient capacity to contend with the water, and capital could not be raised locally to procure a larger plant. Consequently all workings in the deep ground have been for many years suspended.

The value of the auriferous drifts in the terraces has been sufficiently proven by the Greenland and Mont d'Or companies. The latter company has been carrying on hydraulic sluicing operations for many years and paying handsome dividends to the shareholders.

In concluding my remarks on the West Coast, I would observe that this is a portion of the colony which contains large deposits of auriferous gravels as well as numbers of extensive quartz lodes, and where comparatively little prospecting has been done away from the mining centers. The alluvial drifts can not be worked without a considerable capital to construct large water races and proper hydraulic plants to work the ground, and this generally is beyond the means of individual miners unless the ground is very favorably situated and water can be easily brought on to it. I am of opinion that many good mining properties can be acquired on the West Coast which, with sufficient means and judicious management, can be made to pay good interest on the capital invested.

OTAGO.

The principal gold fields of Otago are Tuapeka, Clutha Valley, Manuherikia Valley, Mount Ida, and the Lake district; and although thirty-five years have passed since the discovery of gold in Otago, very little impression is made on the surface of the ground where alluvial mining has been carried on. Gold to the value of £20,643,176 has been obtained from the alluvial workings and far more remains hidden from view; but it is not so easily obtained as in the early days, when the workings were confined to the shallow ground and creek beds. These creek beds formed gigantic ground sluices, requiring only to be cleaned up by manual labor. In the valley of the Clutha there are still plenty of ancient river beds having large deposits of gold-bearing gravels; these, however, being covered with a great depth of superincumbent material, require a large capital to work claims and make them remunerative ventures.

TUAPEKA.

The most important work now being carried on in the neighborhood of Tuapeka is at the Blue Spur. The workings here are in a hard cemented gravel requiring to be blasted and broken up by picks and hammers before it is sufficiently disintegrated to liberate the gold it contains. The present company which holds most of the cemented gravels at the Blue Spur has been working for many years with only a small amount of success. Notwithstanding this, it has not only paid off the whole of its liabilities, which amounted to many thousands of pounds, but the company is now in a position to pay handsome dividends. Last year the profit was over £10,000. The same class of cemented gravels is found at Wetherstone's and Waitahuna, but this deposit has not been worked at these places on such a scale or in such a method as would be likely to give payable returns.

CLUTHA VALLEY.

This valley contains the richest deposit of auriferous drift in the colony. The river itself, being only an immense ground sluice, carries away all the light material, leaving the denser and heavier portions of the gravels, which now cover the bed of the valley. The gold obtained by the various dredges at work in the bed of the river, as well as by the different parties and companies which have claims in this valley, clearly demonstrates the immense wealth that lies buried therein. Gold is found in payable quantities in the bed of almost every river, creek, and stream which are tributaries of the Clutha. The same remarks apply to the Mannherikia Valley. Gold-bearing gravels cover the hills, terraces, and flats, only awaiting a systematic method of working to insure success. There is ample scope for the employment of capital in alluvial mining in these valleys, and with ordinary intelligence and judicious selection of properties many remunerative ventures can be taken up.

LAKE DISTRICT.

The large quantities of gold obtained from the bed of the Shotover River in the early days of the Otago gold fields proves the auriferous character of the country this river traverses, the river itself being nothing more than nature's sluice box, carrying away all the material from the slips which have from time to time taken place from the mountain sides. The hills and mountains, being composed of highly laminated schistose rocks, having gold intermixed, have become disintegrated by the action of the atmosphere and the weather releasing the particles of gold which have for ages been accumulating in the beds of all the different streams. Wherever a deposit of gravel is found overlying the schistose rocks it is generally auriferous, and will give fair returns by adopting the modern methods of working.

At present the object of capitalists seems principally to be the development of the quartz reefs, but I believe in the near future more attention will be devoted to the working of the numerous auriferous drifts in the Middle Island to which I have referred, by the construction of dams for conserving water and water races for sluicing at higher elevations than has hitherto been the case. Alluvial mining is only in its infancy. Water will in the future be brought in from the principal rivers to command the highlands, and when that time comes far more gold will be got than has ever yet been obtained.

WEST AUSTRALIA.

The London Mining World and Engineering Record comments on the gold yield of the mines of West Australia, as follows:

WESTRALIAN MINES IN 1896.

Although the gold production of Westralia during the past year did not come up to the expectations of many who had watched the establishment of the industry with intelligent interest, it can not but be regarded as satisfactory when full allowance is made for the difficulties with which the mining companies have been met, more especially in the outlying districts. In some quarters there has been an attempt to draw unfavorable comparisons between the amount of capital subscribed in this country for Westralian mining undertakings and the results so far obtained; but such comparisons are absurd, for, as Mr. Frank Nicolas stated the other evening, the colony has an auriferous area of over 6,000 square miles, not one-tenth of which has been properly prospected, certainly not one-hundredth part of it has been developed in anything like a proper manner, and not one-thousandth part of it has had the benefit of machinery. But Rome was not built in a day, and even in the Randt district, where the natural conditions were far more advantageous to mining operations than those which have prevailed in Westralia, which a few years ago was but little better than an arid desert, it required a long period of development to bring the output of gold up to a million sterling in a year.

It has also been suggested that the railway extensions should have told a better tale of industrial progress; but, after all, the line to Coolgardie was only opened in March, and the line to Hannan's or Kalgoorlie in September, and the amount of machinery and stores awaiting transport was so enormous that the rolling stock was only able very slowly to grapple with the rush. Moreover, though water is being found in depth in most of the properties, the surface supplies have been uncertain and generally inadequate; while the necessity of complying with needlessly stringent mining regulations in the matter of claim development has seriously affected the resources of very many companies. Gradually, we have no doubt, the general conditions will be improved, for Sir John Forrest's ministry, which has held office since the colony was granted responsible government in 1891, has, in the main, deserved well of the mining interest, and there is apparently a disposition to make concessions in regard to the compulsory employment of a fixed amount of labor per claim, as well as to remove the scandals which have been disclosed in connection with the subordinate sections of the mining department. For the moment, however, we have to do with the past, not with the future.

Up to the end of December the amounts of gold entered for shipment from Westralia have been as follows:

Year.	Ounces.	Pounds sterling.	Year.	Ounces.	Pounds sterling.
1886	302	1,148	1893	110,891	421,385
1887	4,873	18,517	1894	207,131	787,099
1888	3,493	13,273	1895	231,513	879,748
1889	15,493	58,871	1896	281,263	1,068,805
1890	22,806	86,664	Total	967,624	3,676,977
1891	30,311	115,182			
1892	59,548	226,284			

It will be seen from this table that in the past year the increased production, as compared with 1895, amounted to 49,750 ounces, valued at £209,057, representing an addition of about 34 per cent to the shipments of the preceding year, while of the aggregate of £3,676,977 last year's contribution amounted to nearly 30 per cent. It will also be observed that for the first time in its brief history Westralia yielded over a million sterling last year. The monthly returns of gold entered for export in the past two years have been as follows:

Month.	1896.		1895.		Increase (+) or decrease (—) in 1896.
	Ounces.		*Ounces.*		*Ounces.*
January	16,350	£62,130	18,617	£71,009	— 2,336
February	17,922	68,104	15,509	58,935	+ 2,483
March	11,085	42,122	10,619	74,554	— 8,534
April	16,773	63,736	19,128	72,687	— 2,556
May	22,266	84,611	19,208	72,991	+ 3,058
June	27,933	106,148	16,129	61,299	+ 11,804
July	16,258	61,712	20,195	76,743	— 3,937
August	29,517	112,164	23,669	79,940	+ 5,849
September	35,301	134,135	18,245	89,940	+ 17,057
October	27,331	100,156	27,726	105,357	— 394
November	30,874	117,322	15,508	58,930	+ 15,367
December	29,653	112,681	17,890	67,092	+ 11,763
Total	281,263	1,061,800	231,513	879,748	+ 49,750

Taking the years in quarterly periods we obtain the following results:

Quarter ended—	1896.	1895.	1894.	1893.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*
March 31	45,357	53,815	35,368	16,177
June 30	66,972	54,465	40,450	23,121
September 30	61,076	62,109	62,846	25,263
December 31	87,858	61,124	68,467	46,330

It will be seen from this that the output in the last quarter of the year exhibited a very satisfactory increase in the total of 87,858 ounces, being nearly twice as large as that for the first quarter. This tends to show that the railway extensions, facilitating the erection of machinery, is beginning to tell in earnest upon the gold production of the colony. Some idea of the relative contributions of the several districts may be gathered from the following particulars of the gold entered for export in the two closing months of the year:

East Coolgardie, 14,217 ounces, valued at £54,025, in December, against 10,028 ounces, valued at £38,791, in November; Coolgardie, 2,705 ounces, valued at £10,281, in December, against 4,413 ounces, valued at £16,769, in November; Murchison, 8,764 ounces, valued at £33,305, against 6,077 ounces, valued at £23,096; Pilbarra, 2,038 ounces, valued at £7,744, against 169 ounces, valued at £642; Northeast Coolgardie, 1,083 ounces, valued at £4,118, against 1,836 ounces, valued at £6,976; Kimberly, 125 ounces, valued at £475; Yilgarn, 694 ounces, valued at £2,000, against 1,551 ounces, valued at £5,897. (Extract from the Mining and Engineering Record, Jan. 30, 1897, pp. 208–209.)

AUSTRIA-HUNGARY.

The gold yield of the mines of Austria in 1896 was 48,412 florins, or $19,617, representing 948,972 ounces, or 29.51 kilograms fine, and its silver product 1,921,533 florins, or $778,605 (commercial value), equivalent to 1,155,200 ounces, or 35,938.21 kilograms fine.

Hungary produced in 1896 from its own mines 3,211 kilograms of fine gold, of the value of 5,264,255.57 florins, or $2,133,076; and 19,917.72 kilograms of silver, of the value of 1,178,869.47 florins, or $477,678 (commercial value), and of the coining value in United States silver money of $916,326, equivalent to 708,721 ounces, or 22,048.27 kilograms fine.

The total yield of the precious metals, therefore, of the Austro-Hungarian Empire in 1896 stands thus:

GOLD.

Where produced.	Weight.	Value.
	Kilograms.	
Austria	29.51	$19,617
Hungary	3,209.56	2,133,076
Total	3,239.07	2,152,693

SILVER.

	Kilograms.	
Austria	35,938	$1,493,592
Hungary	22,048	916,326
Total	57,986	2,409,918

At which figures it appears in the table of the world's production in this report.

BOLIVIA.

No official returns of the outturn of the precious metals of the mines of Bolivia have been received by the Bureau of the Mint since 1893. The estimate of its silver yield in 1894, made by Mr. Alfred St. John, British consul at Lima, of 22,000,000 ounces, or 684,418 kilograms fine, was provisionally adopted in the report of this series for that year in the absence of more reliable data, and the same figure was assumed for a similar reason to represent its silver product in 1895. In the light of the information since received from unofficial sources, the estimate of Mr. Alfred St. John seems much too large, and the silver product credited by this Bureau to Bolivia in 1894 and 1895 must therefore be reduced. The information referred to is to the effect that since 1893 the richest of Bolivia's silver mines—those of Huanchaca—have again been flooded in their lower galleries. In Potosi the working of the mines yielded only meager results, although 5,000,000 francs have been already expended on them. In the Colquechaca mines the production is on the way to improvement, and in the district of Oruro results are satisfactory.

The production of silver in Bolivia in 1894 is estimated at 14,519,296 ounces, of the value of 45,372,800 francs. Of this amount, 8,468,727 ounces came from the mines of Huanchaca; 1,518,658 ounces from the mines of Oruro; 1,333,318 ounces from those of Colquechaca; 652,010 ounces from the mines belonging to the Guadaloupe country; 365,545 ounces from the mines of Potosi, and 2,181,034 ounces from the five mining districts leased to speculators.

The small amount of gold produced in Bolivia comes from placers, which are quite numerous; but auriferous quartz exists in different parts of the country. The province of Chayata possesses a large gold lode.

The silver product of Bolivia in 1896 is estimated by this Bureau to have been 15,000,000 ounces, or 466,649 kilograms fine, of the value of $19,393,900, and its gold product 36,281 ounces, or 1,128 kilograms fine, of the value of $750,000.

[Extracts from No. 1841, report for the year 1895 on the trade, etc., of Bolivia.]

Bolivia derives her wealth almost exclusively from her mining industry, which is on an important scale. No country in the world has lost so much in consequence of the fall in the value of silver, which is her chief production. This depression has been intensified by other causes—such, for instance, as the influx of water into the lower workings of the Huanchaca mines, and so far the efforts which have been made to drain them have met with no success. In the Potosi, the Royal Silver Mining Company has not been very fortunate, although over £200,000 have been spent. However, an improvement is reported as having taken place of late. In Colquechaca, former mismanagement of the principal mining establishment is said to have been the cause of the diminution in the production, but things are now on a better footing. On the other hand, the mines in the Oruro district have given satisfactory results.

The amalgamating works at Huanchaca have just been closed.

All the ores from Huanchaca and several other mines are now sent to the great reducing establishment at Antofagasta called Playa Blanca. This establishment is one of the largest in the world, and is said to have cost from $7,000,000 to $8,000,000.

The following statement shows the production of silver in Bolivia in 1894, the particulars of which are taken from reports of the large companies and the Government report of silver dues collected in the year:

	Ores.	Bars of pinas.	Total.	Standard ounces Troy.
	Marks.	*Marks.*	*Marks.*	
Huanchaca Co	610,784	457,012	1,067,796	8,468,727
Colquechaca Co	138,771	29,343	168,114	1,333,318
Oruro Mining Co	51,180	140,303	191,483	1,518,658
Guadaloupe Co	2,620	79,590	82,210	652,010
Royal silver mines	4,941	41,150	46,091	365,549
Five districts (licitados)[1]	183,334	91,666	275,000	2,181,034
Total	991,630	839,064	1,830,694	14,519,296

[1] These districts are farmed out by Government to speculators, who paid in in all, in 1894, 121,923 bolivias. This represents approximately 275,000 marks, of which one-third is produced in pinas or bars and the rest in ores. This amount includes the production of the San Jose Mine in Oruro, one of the best mines of the country and lately belonging to English proprietors.

These 14,519,296 standard ounces, valued at 2s. 6d., represent £1,814,912.

The value of the silver shipped as Bolivian produce from Antofagasta alone (Chilian statistics) is, in all, 12,061,382 pesos, each 3s. 2d., equivalent to £1,909,718 16s. 4d.

The silver exportation of Bolivia is believed to be equal to the production, inasmuch as all that is not exported goes to the mint, and the coined money all leaves the country, as every year the banks find great scarcity of silver coin, and have to buy silver to be minted for their account so as to keep up their stock of coin.

It may be of some interest to examine the following statement showing the production of the Huanchaca Silver Mining Company from 1893 to 1896, which has been drawn up by William Murray, an English engineer. It will be observed that the figures given in this statement for 1894 vary slightly from those given in the preceding table, which have been obtained from another source:

PRODUCTION OF HUANCHACA SILVER MINING COMPANY, BOLIVIA.

Year.	Destination of ores.	Quantity.	
		Ores remitted.	Silver produced.
		Spanish quintals.	*Marks.*
1893	Pulacayo mine:		
	To establishment at Huanchaca	363,514	315,518
	To establishment at Playa Blanca	662,078	310,897
	To Antofagasta, for export	396,142	595,354
	Total	1,421,734	1,221,769
1894	Pulacayo mine:		
	To establishment at Huanchaca	401,808	457,012
	To establishment at Playa Blanca	1,011,733	533,198
	To Antofagasta, for export	77,586	124,126
	Total	1,491,127	1,114,366

PRODUCTION OF HUANCHACA SILVER MINING COMPANY, BOLIVIA—Continued.

Year.	Destination of ores.	Quantity.	
		Ores remitted.	Silver produced.
[1]1895	Pulacayo mine:	*Spanish quintals.*	*Marks.*
	To establishment at Huanchaca	414,654	303,758
	To establishment at Playa Blanca	696,044	316,926
	To Antofagasta, for export	.....	.....
	Total	1,110,698	620,684
1896	Pulacayo mine:		
	To establishment at Huanchaca	27,100	26,535
	To establishment at Playa Blanca	660,422	300,000
	To Antofagasta, for export	4,348	7,000
	Total	691,870	333,535

[1] The flooding of Pulacayo mine commenced September 5, 1895.

NOTE.—The remittance of ores from Pulacayo mine to the establishment at Huanchaca was stopped at the end of February, and the establishment itself was closed during March, 1896. The other quantities for this year, or ores sent to Playa Blanca and to Antofagasta, are inclusive to September 15; but it must be understood that the 300,000 and 7,000 marks, respectively, for silver produced have been estimated only, no data being yet obtainable for the proper figures.

The production of ores from Pulacayo mine, corresponding to the years above mentioned, is as follows:

Year.	Quantity.
Ores extracted from the mine:	*Spanish quintals.*
1893	799,825
1894	826,960
1895	896,131
1896	585,050

The quantity of ore taken out of the mine for the year 1896 is inclusive of September 15. On account of the continued flooding of the lower workings and the want of preparation for extracting ores from above the flood level, comparatively reduced quantities of metals were mined during the early months of 1896, but at the moment the average output may be estimated at the rate of about 1,200,000 Spanish quintals a year, taking the last three or four months as a basis.

The difference in the actual outputs of the mine, as compared with the figures showing the quantities of ores treated at Playa Blanca and export ores, is explained by the fact that "relaves" from the old establishment at Huanchaca and reserve low-grade ores at Pulacayo have been constantly forwarded to Playa Blanca for amalgamation and smelting purposes.

The figures for ores treated at Playa Blanca for the year 1895 include purchases from outside sources.

The figures for the year 1896 include none of the ores purchased from other parts. The export quantity of 4,348 Spanish quintals was dispatched to Germany, England, France, and the United States, in four equal lots, with the object of obtaining comparative results as to cost, amount of silver extracted, etc., from those different countries.

Gold washing is carried on in Bolivia, but on a small scale. At Tipuani to the north of La Paz a good deal of this metal has been obtained at different times from auriferous alluvia.

Even from the bed of the La Paz River, within thirty minutes' walk of the city of that name, small quantities are obtained yearly.

Auriferous quartz is found in several parts of the country, A reef of considerable length exists in the province of Chayanta, and another at San Simon on the banks of the River Itenes. The latter has been greatly extolled, but it is said that fevers and wild Indians impede mining operations.

BORNEO.

The production of gold in Borneo, according to the Jaarcijfers uitgegeven door de Centrale Commissie voor de Statistiek, Koloniën, 1895 en vorige Jaaren, for the years 1886 to 1895, inclusive, was as follows:

Year.	Weight.	Value.
	Kilograms.	
1886	149	$99,025.40
1887	178	118,298.80
1888	136	90,385.60
1889	.....	.....
1890	62	41,205.20
1891	94	62,472.40
1892	98	65,130.80
1893	136	90,385.10
1894	112	74,435.20
1895	111	73,770.60

The production of gold in Borneo in 1896 is assumed to have been the same as in 1895.

BRAZIL.

Concerning the gold yield of the mines of Brazil, the report of this series for 1893 said:

The returns of the gold output of the Brazilian mines are very difficult to obtain, as will be seen by the answers of our ministers to that country to the interrogatory relating thereto in the annual circulars of inquiry of this Bureau for the years 1886, 1888, and 1891.

"Gold mining in Brazil is a private industry, carried on in different provinces by companies and individuals, with the permission of the Government, but free of any official supervision, and as there is a duty on the gold exported to other countries no exact information exists as to the quantity produced in 1885." (Mint Report, 1887, p. 365.)

"The weight of the gold produced at the mines and received at this mint (of Rio de Janeiro) for smelting and assaying was 351.266 kilograms, of the value of 402,808 milreis." (Mint Report, 1889, p. 234.)

"Pursuant to instructions in circular from Department of State, I have the honor to report that the only statistics on the subjects named I have been able to obtain from the Brazilian Government, after repeated written and verbal requests, are those given in the table herewith." (The coinage of the Brazilian mint for 1891.) (Mint Report, 1892, p. 249.)

The statistics of the Brazilian output of gold being so meager, resort must be had to an estimate of the production of the country, which may be based on the sum of

the coinage and exports of gold (so far as ascertainable) of the country. The export of gold to Great Britain and the coinage of gold at Rio de Janeiro were as follows for the years named:

Year.	Imports.			Coinage value.	Total value.	Kilograms.
	British standard ($916\frac{2}{3}$).	Fine ounces.	Value.			
	Ounces.					
1891	18,886	17,312	$357,871	$499,941	$857,812	1,291
1892	19,486	17,862	369,240	*a* 499,941	869,181	1,308
1863	*b* 19,486	17,862	369,240	*a* 499,941	869,181	1,308

a Assumed to be the same as 1891. *b* Assumed to be the same as 1892.

This would make the value of the gold product in 1891 $857,812, representing 1,291 kilograms. Assuming the amount coined in 1892 and 1893 to have been the same as in 1891, and the amount exported in 1893 the same as in 1892, the gold product of each of those years would be $869,181, representing 1,308 kilograms, at which figures the Brazilian gold output appears in the table of the world's production in this report as provisional estimates.

In an article in the Economiste Français of September 23, 1893, Mr. Fournier de Flaix writes:

"Gold mines exist and are worked in the majority of the States of Brazil, notably in Ceara, in the State of Bahia, and especially in Minas-Geraes and Goyaz. The annual production of gold is estimated at 10,000,000 francs."

This Bureau can find no facts on which to base any such production.

In the report for 1894 it was said in reference to the same subject:

In the Report on the Production of Gold and Silver in 1893 it was remarked that in an article in the Economiste Français of September 23, 1893, Mr. Fournier de Flaix wrote:

"Gold mines exist and are worked in the majority of the States of Brazil, notably in Ceara, in the State of Bahia, and especially in the States of Minas-Geraes and Goyaz. The annual production is estimated at 10,000,000 francs."

And the comment was added:

"This Bureau can find no facts on which to base any such production."

Subsequently, a letter was addressed by the Director of the Mint to Mr. Fournier de Flaix, asking him to be good enough to mention on what authority he credited so large an output of gold to Brazil. To this inquiry Mr. Fournier de Flaix replied as follows:

"PARIS, *December 6, 1894.*

"SIR: Various delays have not allowed me to answer sooner the letter in which you ask me where I found my information on the production of gold in Brazil. I found that information in the work of Mr. Santa Anna Nery, Brazil, 1889, page 75, who estimates the production of the mines of Minas-Geraes alone at 9,150,000 francs per annum.

"Recently I read a memoir of Mr. Paul Ferrand on the same mines, in which that production is given at 13,500,000 francs.[1]

"My estimates are, therefore, warranted.

"With the highest consideration, I am, your devoted servant,

"E. F. DE FLAIX.

"DIRECTOR OF THE MINT,
"Washington, D. C."

[1] Mr. Ferrand published an exhaustive work on the Minas-Geraes mines in 1894.

In view of the high standing of Mr. Fournier de Flaix as an economist, statistician, and cautious writer, this Bureau feels warranted, after his explanation contained in the above letter, and in the absence of any information from our minister to that country, to place the gold product of Brazil for 1892, 1893, and 1894 at the average between 9,500,000 and 13,500,000 francs, or 11,500,000 francs, or about $2,219,500, representing 3,339 kilograms. It appears in the present report at these figures.

Lastly, in the report for 1895 the following was written on the same subject:

No report has been received by this Bureau of the production of gold in Brazil in 1895, and it therefore appears in this report at the same figure as in 1894, viz, 3,339 kilograms fine, of the value of $2,219,500.

This figure is a mean between the estimates of the production made by Santa Anna Néry in 1889 and by Mr. Paul Ferrand in 1894, in his work on the Minas-Geraes mines. Mr. Ferrand wrote his book in Minas-Geraes and it was published there.

The above figures can be taken only as an estimate. Professor Lexis thinks them too high. He writes:

"The principal mines of Brazil are Ouro Preto and San João del Rey (Morro Velho). The first produced during the business year ended June 30, 1895, £60,097 worth of gold. The latter has paid no dividends for a long time. In recent years, however, its situation has improved and its output of gold in 1895 averaged £10,000 to £11,000 per month, or about £125,000 in the entire year. The remaining mines, of which, for instance, the Santa Barbara mine, has paid no dividends since 1886, produce scarcely more than 1,000,000 marks a year. For these reasons I am induced to estimate the total production of Brazil at not more than 5,000,000 marks (or $1,190,000)."

As Mr. Ferrand wrote his book on the spot, only a few years ago, it is reasonable to assume that the figure he gives is approximately correct, which is all that is claimed for it here, and it is therefore allowed to stand, but only provisionally and subject to all reservation.

This Bureau hesitates to continue crediting Brazil with the same amount of gold product year after year. No principle of statistical science warrants such a course. Ferrand's estimate was published by this Bureau only provisionally during the past two years, and it is deemed advisable, even at the risk of crediting Brazil with too small a gold output, to substitute for the estimate of Professor Ferrand other figures with an undoubted basis in fact.

From unofficial but entirely reliable sources the Bureau has learned that in 1896 "the mining companies of the State of Minas-Geraes, notwithstanding unfavorable circumstances, extracted 1,961 kilograms of gold, representing a value of 5,285,890 milreis, producing for the treasury a revenue of 132,526 milreis." (L'Economiste Européen, June 18, 1896, p. 798.)

The value of the 1,961 kilograms of gold given above is not expressed in gold milreis, as becomes evident from a very simple calculation. The gold value of the milreis in United States money is $0.546. On the supposition that the 5,285,890 milreis were gold, they would represent in United States gold coin $2,886,096, corresponding to a weight of 4,343 kilograms fine. But the amount reported to have been produced was only 1,961 kilograms, and it is probable that the latter quantity was not fine gold. Calculating the value of 5,285,890 milreis on the

supposition that it was a gold value would make the value of a kilogram of crude gold equal to $1,472, whereas the value of a kilogram fine never exceeds $664.60 in United States gold.

This is proof that the value of the gold produced in Minas-Geraes in 1896, viz, 5,285,890 milreis, is expressed in a greatly depreciated currency, which must be the paper milreis of Brazil, as silver does not circulate there. The average rate of exchange of the milreis in 1896 was $9\frac{1}{16}$ d. This would make the value of the gold produced in Minas-Geraes in 1896 $971,337, representing 1,461.53 kilograms fine.

The figure thus reached for the gold product of Brazil in 1896 can not be far from representing the actual gold product of the country. It does not differ greatly from the estimate made by Professor Lexis of the gold outpnt of the Republic in 1895, and is borne out by what Dr. Soetbeer said of the gold yield of Brazil, viz, that since 1880 it can not have much exceeded 1,000 kilograms.

Place is here made for an extract from a paper written in 1891 by that eminent statistician on the production and employment of the precious metals in the period 1881–1890. It is as follows:

Mr. Santa Anna Néry (Le Bresil en 1889, Paris, 1889) estimates the gold production of Brazil up to 1888 at the enormous figure of 658,228 kilograms (1,843,000,000 francs), of which there were produced in the period:

	Production.	Annual average.
	Kilograms.	*Kilograms.*
1700–1820	534,403	4,450
1820–1860	63,825	1,535
1860–1888, about	60,000	2,142

The estimate for the last mentioned period (1860–1888) must be too high, and the Brazilian production of gold, especially since 1880, can not have much exceeded 1,000 kilograms.

In the businesss year 1885-86 the Morro Velho and Cujaba mine of the St. John de Rey Mining Company yielded 869 kilograms of gold, and other mines in the year 1885 only about 170 kilograms of gold. In the years following 1885 the gold production of Brazil diminished still further.

Experts assure us that the gold production of Brazil is capable of great development, as thus far only the decomposed outcrops of the very extensive quartz lodes have been worked, and the masses of auriferous ores in the Cujaba mine is simply enormous.[1]

Minas-Geraes, however, is not the only province in Brazil in which gold is produced. It is worked also in the provinces of Ceara, Bahia, Goyaz, and Matto-Grosso, and the figure given above does not represent the total gold output of Brazil, which may, for 1896, be safely placed at $1,200,000, representing 1,805.59 kilograms.

Mr. Ferrand remarks that the gold from the Passagem mine is exported to London. It is not unlikely that most of the gold produced in Brazil every year goes to the same destination. The gold exports of bullion

[1] Dr. Ad. Soetbeer. Edelmetallgewinnung und Verwendung in den Jahren 1881 bis 1890.

from Brazil to England in 1893, were 16,833 ounces; in 1894, 20,851 ounces; in 1895, 50,724 ounces, and in 1896, 52,828 ounces (all 0.916⅔ fine), respectively, corresponding to 480, 595, 1,446, and 1,506 kilograms, of the value of $318,972, $395,109, $961,178, and $1,001,047, respectively.

In the table of the world's production, in this report, the product of gold in Brazil is placed at the following figures:

1896	$1,200,000
1895	1,190,000
1894	1,190,000

For 1893 the figures should be reduced to about the same amount.

Dr. Hauchecorne, writing of the gold product of Brazil, says of it in his report to the Berlin Silver Commission: "The gold production of Brazil, which centers mainly in the provinces of Minas-Geraés, Goyaz, and Matto-Grosso, began toward the end of the seventeenth century. According to Soetbeer, it reached its greatest height in the years 1741-1760, in which an average annual production of 14,600 kilograms (469,390 ounces) was reached. Since then it has steadily declined to the present figure of 600 to 700 kilograms (19,290 to 22,505 ounces), small, as compared to former outputs."

In the time since 1880 the gold production was:

Years.	Ounces.	Kilograms.	Years.	Ounces.	Kilograms.
1880	43,241	1,344.977	1888	21,540	669.984
1882	35,879	1,115.988	1890	21,540	669.984
1884	30,606	951.975	1892	*a* 21,186	658.974
1886	48,289	1,501.991			

a Report of the Berlin Silver Commission, 1894, p. 1239.

BRITISH INDIA.

The production of gold in the State of Mysore, India, in 1896, was 10,003.325 kilograms 0.916⅔ fine, equal to 9,169.714 kilograms fine, of the value in United States money of $6,094,192.

The gold product of the Madras Presidency in 1896 was 59.619 kilograms 0.916⅔ fine, equal to 54.651 kilograms fine, of the value in United States money of $36,321.

The total gold product of the mines of British India in 1896 was 10,062.944 kilograms of the standard fineness of 0.916⅔, representing 9,224.365 kilograms fine, of the value in United States money of $6,130,513; an increase as compared with 1895 of $1,374,735.

GOLD MINING IN THE COLAR FIELD OF MYSORE, INDIA.

By One who has Studied It.

We have had in the past year another record output of gold from this field (vide Table 1 annexed), for whereas the output for 1895 surpassed that of 1894 by somewhat over £150,000, that for 1896 surpassed the one for 1895 by about £255,000—no

less than the splendid return of £1,251,738 being recorded for last year. Brilliant as this return is, it will, I do not hesitate to say, be far eclipsed by the one for the present year, provided nothing very untoward should happen to militate against the actual working of the mines. I look in this period to the Mysore mine alone giving a yield of about half a million sterling, to the Nundydroog and Ooregum, between them yielding another half million, to the Champion Reef giving a yield of no less than £600,000, and to the other mines that may have made crushings during the year to a total of about £75,000, or even considerably more, thus giving the total magnificent yield of about £2,675,000 for the year.

Some may possibly consider the foregoing estimate too sanguine, but I think that after they have followed me in my review of the past year's operations in this field, and of what is dawning upon us in the near future, they may, at any rate, not see much to take exception to in my expectations for this industry during the present year.

Since my last review of gold mining in this field, which appeared in the Mining World of July 25, 1896, several of the companies having properties in this field have held meetings, viz:

(1) Mysore West and Mysore Wynaad companies in August, at which a far better account of their jointly held property—the Tank Block—was given than on any previous occasion, and although lately the returns have somewhat fallen off in value, only a comparatively slight increase in the richness of the quartz is required to improve matters here.

(2) Balaghat-Mysore, on November 17, at which a reconstruction scheme was agreed to, which, when carried through, will give the company about £40,000 working capital, of which it is estimated that about £10,000 will be required for new machinery. It is proposed to unwater the mine as early as possible to the depth of 800 feet, which depth had been reached, but which, through lack of funds to deal with the water that then made its appearance, had to be abandoned.

Next, after accomplishing this, it is the intention to drive levels to intersect the rich ore which is now appearing in the Coromandel mine—its neighbor to the north—and on the accomplishment of this, if not, indeed, earlier, the company will not unlikely commence an era of prosperity which has as yet been denied to it.

(3) Colar Central Company has held a meeting, but this was for the purpose of going into liquidation with no ulterior motive of reconstruction; however, later on it may possibly revive under a different nomenclature and directorate and yet be a success.

(4) Champion Reefs Company held its annual meeting only on December 17 last, at which everything went right merrily, and a most glowing prospect for the future was held out. A new company, the Road Block Gold Mining Company, has recently been floated, having a property in this field consisting of 600 acres, with a run of 3,000 feet on the Champion lode situated to the north of the Coromandel block; its prospects are considered good from the prospecting that has been done on the property. It is capitalized at £150,000 in £1 shares.

Let us now glance at what is being done at the different mines.

The Mysore has during the past year opened up in magnificent style, having a number of rich points exposed in its labyrinth of underground workings. In October, in the 790 north of McTaggart's, a lode of 1½ feet thick was met with, assaying over 2 ounces of gold per ton; this is practically in virgin ground, and augurs well for the future of this part of the property. In November, in Rowse's shaft in the 1,460 level, a winze had been sunk to a depth of 88 feet, and there a lode 1 foot wide was encountered, assaying over 1 ounce 8 pennyweights. At the same time this news came to hand we learned that, in consequence of repairs to the skip rope below the 1,460 level, driving in the 1,620 level would be delayed until completion of the same. A grand future for Mysore is secured. Crocker's shaft has been proved wide and rich all the way down, and is still intact from the 890 to the 1,460 foot level—a very remarkable fact. The 1,160 north, after being driven upon for 417 feet, is now 4 feet

in width, assaying 3 ounces. This is considered a most important point in the mine, as this discovery is also practically in virgin ground.

The foregoing are a few of the most important features in the mine. It may be remembered that no fewer than 12 shafts are sunk on this property, and most of them to considerable depths, Ribblesdale's being the deepest at 1,620 feet, and occupying a more central position in the property than any other. The final dividend to be declared for the past year in March next will probably be 7s. per share, which will, with the previous ones of 6s. and 7s. amount to 100 per cent for the year. The shares of this company, which stood at £7 10s. each in July last, have touched over £9 since. It is probable that ere long they will, in view of the splitting scheme shortly to be recommended to the shareholders, be equal to £10 or over in value. The Ooregum has, during the past year, through the falling off in the richness of the quartz, given a less yield; but it is to be hoped that the news to hand about the middle of November last, stating that a decided improvement had occurred in Taylor's shaft at the 960-foot level, where the lode measured 2½ feet in thickness, assaying over 3 ounces 5 pennyweights, will prove to be the turning point, and that the mine will shortly be having another very brilliant era of prosperity. On this property 8 shafts have been sunk, the deepest of which is Wallroth's at 1,271 feet from surface. The dividend on the ordinary and preference shares, respectively, for the past year have amounted to 6s. 6d. and 8s. 6d., or 1s. per share less than in 1895.

At the Nundydroog mine the outlook generally is prosperous. In No. 1 winze (the deepest point in the mine) the lode in October last was reported to be 3½ feet thick, assaying 3¾ ounces of gold per ton, and in Kennedy's shaft, at the same period in the 700-foot level, the lode was 2 feet, assaying over 1 ounce 12 pennyweight. In November Kennedy's shaft was down to the 773-foot level. The lode in the winze 26 feet below the 700-foot level was 15 inches wide, assaying 1 ounce 15 pennyweight. In north shaft in 700-foot level the lode was reported 4 feet thick, assaying over 2½ ounces per ton. At the bottom of Taylor's the lode was 3 feet thick, but only assaying a little over 2 pennyweights. The cyanide plant erected on the mine is equal to the treatment of 2,500 tons of tailings per month, and will shortly be at work. This mine has five shafts sunk upon it, the deepest of which (Taylor's), situated in the southern portion of the property, is down 1,240 feet from the surface. Nundydroog shareholders have so far received 4s. per share dividend, and the final one of the year will probably be one of 2s. 6d., which will give a total of 6s. 6d., or 1s. 6d. per share in excess of that declared for 1895. The shares of this company have been firmer of late, and will in the near future probably see higher prices.

Mysore Reefs.—Here in November in the underlie shaft at the 930-foot level the lode was reported 18 inches wide, worth 4½ pennyweights. In the 550-foot level the lode was 3 feet thick, worth 15 pennyweights. In the vertical shaft the stopes in the bottom assayed 6 pennyweights. There was also a most promising lode in the 260-foot level. The underlie shaft was down 930 feet, and the vertical 425 feet from surface.

Nine Reefs in November had the main shaft down upon the Oriental lode 436½ feet. The width of lode there was 2½ feet, assaying 2 pennyweight 15 grains. In the 310-foot level the lode was 6 feet wide, assaying over 14 pennyweights. Morrison's shaft, at the 280-foot level the lode was 3 feet, assaying 3 pennyweights 15 grains. In December report, in winze 9 feet below 310-foot level, there was a lode 5 feet wide, worth 1 ounce 3 pennyweights 5 grains. Eight shafts have been sunk on this property, of which Vivyan's has reached the greatest depth—460 feet. The price of these shares has been higher of late.

Kempinkote.—The shaft in the new property—now once more in the Colar Field—in December was down 189 feet, with a slight trace of gold in quartz then found, but this was considered of no importance.

Tank Block.—This property is owned conjointly by the Mysore West Company and Mysore Wynaad Company, and has three shafts sunk upon it, viz, the North shaft, South shaft, and Walker's shaft. Working has for a year or more been suspended

at the North shaft, but for some time past work has been energetically carried on at Walker's shaft in the northern part of the property. This shaft, in May last, at the end of the company's financial year, was reported as having reached the depth of 83½ feet. The shaft now has, by latest advices in the beginning of December, attained a depth of over 152 feet, which has been at the rate of 12 feet of sinking per month. We shall, doubtless, hear of levels being driven from this shaft, when not unlikely soon after their commencement there may be pleasing intelligence to communicate to the shareholders, as it is expected that the Coromandel lodes will be here encountered. At the beginning of December it was reported that the South shaft recently attained a depth of 566½ feet, when it was stopped to crosscut west to the lode, which was then in over 25 feet in very hard rock. At the same date the level that is being driven north at the 507-foot level was reported in 312 feet, with a lode of 2½ feet of very good looking quartz, but so far the value was low. A winze had been sunk from the 450-foot level 28 feet, where there was a lode 9 inches wide, worth 14 pennyweights.

There was also a lode in No. 2 stope on the Nundydroog boundary 5 feet wide, worth 1 ounce of gold per ton, but this was reported beaten through; and, further, No. 2 stope on the Nundydroog boundary 5 feet wide, worth 1 ounce of gold per ton, but this was reported beaten through; and, further, No. 2 stope on the east lode in the same level had a lode 3 feet wide, worth 18 pennyweights per ton. In the beginning of September a telegram was received from the Tank Block as follows:

"Have followed the ore down by a winze for 20 feet below the level 507. The lode is dipping into our ground. The width of the lode is 3 feet, worth 30 pennyweights."

This lode has been reported on by letter on several occasions since the date of the telegram as varying in width between 2 and 3 feet, and in value between one-half ounce and 1½ ounces of gold per ton in its course downward for a distance of over 47 feet, which depth it had reached in the early part of November. It is to this lode, apparently, that the crosscut from the 566-foot level is being directed, and when it is reached a valuable piece of stoping ground will be secured to the property. The lode in the winze below the 450-foot level, when attached by a level from the 507-foot level, should also give the property another valuable piece of stoping ground. Judging from the smaller returns lately made by this property, and from the large shrinkage that has recently taken place in the price of its shares (from about 26s. to 9s.) one would think that prosperity was forsaking it; but, taking due account of the importance of the above telegram and also mining reports, its prosperity seems now only to be commencing. The Balaghat-Mysore is at present undergoing reconstruction, and there is here nothing particular to note.

The gold fields of Mysore has a very large property of about 7,000 acres in this field, portions of which it will doubtless find purchasers for at various times. The securities held by this company are believed to have been considerably appreciated in some of the older properties in which it is interested, but to have suffered in depreciation in the newer ones considerably—hence, probably, the cause of the dormant state of its shares. It is essentially a parent company, though by no means wholly so.

Yerraconda.—The South shaft in this property is down 350 feet from surface. The quartz there is 3 feet thick, but of the low assay of 1 pennyweight 20 grains. In December there was no improvement in the lode, the funds were becoming exhausted, and the state of affairs was reported to be generally unsatisfactory. The Colar Central is being wound up, with little prospect of a reconstruction.

Champion Reef.—It will suffice to say little in respect to this property, as a most exhaustive annual report has very lately been submitted to the shareholders at their annual meeting. It is now occupying the premier position on the field as a gold producer. It has recently increased its reserves of ore from 45,000 tons to 155,000 tons, valued at about £700,000. Its tailings have been increased from 33,000 tons to 113,000 tons. This mine is opening up in magnificent style, and is likely to produce the greatest yield of gold of any mine in the field during the present year. It has

six shafts sunk on its property, of which Garland's on its southern portion was in December down 1,093 feet, with a lode in the bottom 2 feet in width, assaying 1 ounce 14 pennyweights. The shares have much appreciated of late, and are likely to do so considerably more in the near future, especially now that the proposed rearrangement of capital has recently been decided upon, which it is thought will greatly facilitate market dealings. With the final dividend of 5s. per share paid in December last, this company has distributed among its shareholders 13s. 6d. per share for year ending in September last, or 67½ per cent. This distribution in every probability will be greatly exceeded for the present year.

Coramandel Company only commenced regular monthly crushings in April of last year, from which time to the end of 1896 about £24,000 of gold had been won, and large reserves of good ore are reported as available. A lode which in December last was reported almost pinched out in Prospect shaft was later in the month reported to have greatly improved and to have made an excellent show of gold in panning, and it was stated to be looking exceedingly well at the 700-foot. There are two shafts sunk on the property, the new East to a depth of 500 feet and the Prospect to a depth of 700 feet. The Oriental, in December, report their engine shaft to be down 246 feet. The main object aimed at for the present by this company is the cutting of the Champion lode in depth.

Taking into consideration the points in the foregoing notes on various reports and telegrams from the field during the latter part of 1896, it should not be surprising to see the forecast that I have made for the yield of 1897 verified. The large mass of rich quartz that is exposed in Crocker's shaft should alone enable the Mysore Company to arrange a monthly return equal to the highest recorded in the past year, and the probability is that there will be no difficulty in extracting sufficiently rich quartz from other parts of the mine in large enough quantities to raise the average monthly output to over £40,000 in value. The stamping power already erected and at work on the Mysore property is without additions sufficient for this purpose, as there is no warrant for any falling off in the quality of the ore stamped. The Nundydroog property is opening up so favorably, too, that there should be no difficulty, especially with the aid of 70 stamps at work instead of 50, and the cyanide works in full operation, of raising the monthly return sufficiently over the one of about 4,000 ounces which it has recently been giving, so as to give a yield enough to bring the total return to one of £250,000 in value.

The Ooregum mine also, from recent indications in its lower depths, gives promise of soon yielding as largely and richly as ever again, and so should experience little or no difficulty in producing largely enough to give a total value of £250,000 for the present year. By the last annual report to hand of the Champion Reefs Company the reserves of ore exposed to the present time alone on their property were valued at £700,000, while the company has in its reserves of tailings a further valuable asset, and these reserves are being daily added to largely, so we are advised by the satisfactory way in which the property is opening up. Taking the foregoing into consideration, and the fact that the stamping power now available at the mine is nearly 50 per cent more than at any time during last year, with the exception of that for December, there should be no difficulty, of course, barring unforeseen casualties, of producing gold from this property to the value of at least £600,000 sterling. There is sufficient stamping power, both on the Tank Block and Coromandel properties (20 on each) already erected to enable each of these properties to crush at least 1,400 tons apiece of quartz, which at the low average of a little over one-half ounce per ton, should enable these properties alone to give a yield of £70,000 in value; but it is only reasonable to conclude that, taking into consideration the reserves that are being opened up in them, this yield should be considerably exceeded. Also, from what we glean of the doings on the Mysore Reefs and Nine Reefs properties we may conclude that they will give better results during this year than last.

The Balaghat-Mysore tailings will probably soon give out, and as fresh quartz extractions to any extent on this property are not expected for a year or more we must, unfortunately, look this year for a smaller yield of the precious metal than was obtained last. The other companies operating in this field during the present year are not at all likely to add more than the result from a trial crushing, or two, perhaps, to the production of this field. An investor in any or all of the four largest producers of the precious metal in this field at their present prices would probably have no cause in the future for regret. Of the cheaper shares I think the better ones for purchase would be found those of the Mysore West, Mysore-Wynaad, Coromandel, Mysore Reefs, and Nine Reefs. Mysore West and Wynaad have 10 heads of stamps at the mine beyond the 20 heads already erected, which could probably very shortly be made available for crushing at any time the increase in the output of ore warranted the same.

In regard to the outlook for deep mining in this field, I may say I consider it with the recent very rich developments in the lower levels in the properties to be very bright, and should this prove to be so, as we may reasonably conclude it will, Colar gold mining will flourish for many generations. Mining in different parts of the world is now carried on at great depths, as instanced at the Speremburgh Borehole, Berlin; at the Calumet and Hecla, Lake Superior; and as also at the Parnstowit Borehole, Upper Silesia, which are, respectively, down to depths of 3,492, 4,580, and 6,573 feet. It may be interesting to add that at Mr. Lansell's No. 180 mine in Victoria gold has been struck and worked at no fewer than 3,200 feet from surface.

Gold mining is now, through the great success attending it in this field (vide tables annexed), being prospected in other parts of India, and in the Wondalli, Hyderabad-Deccan properties especially, with excellent prospects, £20,000 has been already spent on prospecting in this company's very extensive property. The Colar gold field will soon be producing its millions annually. (Extract from the Mining World and Engineering Record, p. 164.)

Mysore Returns for 1896—Ore Stamped, Tailings Treated, and Gold Produced.

[Extract from The Mining World and Engineering Record, March 20, 1897, p. 511.]

Twelve months, to December 31, 1896.	Quartz treated and gold extracted.			Tailings treated and gold extracted.		
	Quantity of quartz stamped.	Bar gold extracted.	Produce per ton of quartz.	Quantity of tailings treated.	Bar gold extracted.	Produce per ton of tailings.
	Tons.	*Ounces.*	*Oz. dwt. gr.*	*Tons.*	*Ounces.*	*Dwt. gr.*
January	5,351	8,893	1 13 6	4,570	999	4 9
February	5,050	6,186	1 4 12	3,600	803	4 11
March	5,540	8,042	1 9 1	3,200	591	3 17
April	5,714	8,088	1 8 8	3,300	601	3 15
May	5,400	7,162	1 6 13	4,880	1,350	5 13
June	5,328	7,429	1 7 21	4,380	1,357	6 5
July	5,454	7,621	1 7 23	4,350	1,167	5 9
August	5,300	7,774	1 9 8	4,460	1,202	5 9
September	5,060	7,736	1 10 14	4,300	1,400	6 12
October	5,290	7,935	1 10 0	4,405	1,142	5 4
November	5,300	8,031	1 10 7	4,440	1,059	4 18
December	5,510	8,006	1 9 1	4,640	1,214	5 6
	64,297	92,903	17 8 22	50,525	12,885	5 2

MYSORE RETURNS FOR 1896—ORE STAMPED, TAILINGS TREATED, ETC.—Continued.

Twelve months, to December 31, 1896.	Tailings treated by cyanide process.			Total bar gold produced.	Standard gold.	Net amount realized.		
	Quantity of tailings treated.	Bar gold extracted.	Produce per ton of tailings.					
	Tons.	*Ounces.*	*Dwt. gr.*	*Ounces.*	*Ounces.*	£	*s.*	*d.*
January	1,820	307	3 9	10,199	10290.126	40,211	17	2
February	1,750	306	3 12	7,295	7303.594	28,379	17	0
March	1,820	301	3 7	8,934	8995.843	34,972	19	11
April	1,705	280	3 7	8,969	8974.084	34.881	13	0
May	1,845	333	3 15	8,845	8837.150	34,342	19	6
June	1.610	169	2 2	8,955	9005.828	35,024	10	8
July	1,670	250	3 0	9,038	9085.736	35,374	5	2
August	1,760	157	1 19	9,133	9181.025	35,766	13	3
September	1,677	192	2 7	9,328	9365.517	36,478	6	7
October	1,820	254	2 19	9,331	9397.259	36,590	15	11
November	1,890	251	2 16	9,341	9405.564	36,622	5	5
December	1,750	193	2 5	9,413	9489.055	36,939	17	9
	21,117	2,993	2 20	108,781	109330.781	425,586	1	4

TABLE SHOWING OUNCES OF GOLD PRODUCED, AND VALUE, BY THE COMPANIES NOW AT WORK ON THE COLAR FIELD, FOR THE YEAR ENDING DECEMBER 31, 1896.

	Mysore.		Nundydroog.		Balaghat-Mysore.		Ooregum.		Champion Reefs.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Ounces.		*Ounces.*		*Ozs.*		*Ounces.*		*Ounces.*	
January	6,349	£24,765	3,323	£12,430	120	£431	6,180	£23,124	6,291	£24,030
February	10,145	39,633	3,581	12,538	211	743	6,170	23,088	6,304	24,081
March	8,934	34,972	3,550	13,358	312	1,110	6,057	22,827	6,503	24,868
April	8,969	34,814	3,563	13,395	336	1,178	6,119	23,039	6,643	25,396
May	8,845	34,342	3,571	13,355	268	961	6,029	22,758	6,730	25,682
June	8,955	55,024	3,589	13,264	306	1,094	5,332	20,044	6,433	24,638
July	9,038	35,374	3,863	14,095	211	757	5,288	19,918	6,617	25,328
August	9,133	35,763	3,918	14,655	237	841	5,109	19,306	7,011	26,665
September	9,328	36,478	4,080	15,275	182	652	5,021	18,939	7,605	29,075
October	9,331	36,590	4,081	15,305	278	991	5,037	18,958	8,004	30,551
November	9,341	36,622	4,085	15,322	225	817	4,976	18.742	8,204	31,323
December	9,413	36,437	4.031	15,621	165	640	4,257	16,496	9,641	37,359
Total	102,771	440,817	45,175	168,613	2,851	10,215	65,575	247,239	85,986	328,996

TABLE SHOWING OUNCES OF GOLD PRODUCED, AND VALUE, ETC.—Continued.

	Mysore West and Mysore Wynaad (tank block).		Mysore Reefs.		Coromandel.		Nine Reefs.		Total value for month.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
	Ounces.		*Ounces.*		*Ounces.*		*Ounces.*		
January	544	£2,670	179	[1] £694	.....	.....	.....	.....	£88,144
February	654	2,487	153	[1] 593	.....	.....	.....	.....	103,163
March	701	2,696	114	[1] 442	.....	.....	.....	.....	100,273
April	703	2,707	81	290	452	£1,731	.....	.....	102,550
May	706	2,724	102	382	580	2,209	.....	.....	102,413
June	422	1,593	94	299	620	2,385	.....	.....	118,341
July	452	1,735	(?)	(?)	710	2,748	.....	.....	99,955
August	474	1,831	137	483	720	2,731	.....	.....	102,278
September	285	1,100	(?)	436	810	3,100	.....	.....	105,055
October	371	1,441	203	738	792	3,033	.....	.....	107,607
November	384	1,488	427	1,637	800	3,035	.....	.....	108,986
December	404	1,566	355	1,376	812	3,147	62	£241	112,883
Total	6,100	24,038	1,845	7,370	6,296	24,119	62	241	.....

MYSORE RETURNS FROM COMMENCEMENT TO DATE.

[Extract from The Mining World and Engineering Record, March 20, 1897, p. 511.]

Date.	Quartz crushed.	Tailings treated.	Bar gold from quartz and tailings.	Amount realized.		
	Tons.	*Tons.*	*Ounces.*	£	*s*	*d.*
Year ending—						
September, 1884	454	.....	454	1,732	9	7
September, 1885	1,616	.....	3,754	14,675	4	5
September, 1886	6,077	.....	15,776	61,953	0	10
December, 1887 (15 months)	14,061	737	16,280	63,400	12	6
December, 1888	20,191	4,319	19,090	73,349	13	1
December, 1889	32,567	13,227	49,234	193,535	9	7
December, 1890	38,812	18,535	58,181	228,966	16	4
December, 1891	40,353	20,821	66,499	261,485	0	8
December, 1892	44,548	38,727	64,391	249,331	15	1
December, 1893	49,822	50,249	65,409	254,311	9	8
December, 1894	60,957	54,511	52,273	203,087	6	2
December, 1895	60,654	56,662	69,487	270,911	0	8
December, 1896	64,297	71,664	108,781	425,586	1	4
	434,409	329,430	589,609	2,303,325	19	11

CANADA.

This Bureau has received the following information relative to the production of gold and silver in the Dominion of Canada in 1896:

OTTAWA, *March 31, 1897.*

DEAR SIR: Replying to your request of March 27, for a statement of the production of the gold and silver in Canada for the calendar year 1896, for use in the Report of the Production of the Precious Metals for that year, I have much pleasure in inclosing said statement herewith.

Yours, truly,

GEORGE M. DAWSON, C. M. G., etc.,
Deputy Head and Director Geological Survey of Canada.

R. E. PRESTON, Esq.,
Director of the Mint, Treasury Department, Washington, D. C.

PRODUCTION OF GOLD AND SILVER IN CANADA, 1896.

[By Dr. G. M. Dawson, C. M. G., etc.]

Province.	Gold.		Silver.	
	Quantity.	Value.	Quantity.	Value.
	Ounces.		*Ounces.*	
Nova Scotia (quartz)	25,348.500	$524,000	70,000	$46,900
Quebec (gold placer)	145.125	3,000	.....	.....
Ontario (quartz)	6,772.500	140,000	.....	.....
Northwest Territories, including—				
Yukon (placer)	17,173.125	355,000	.....	.....
British Columbia:				
Placer	26,317.258	544,026	.....	.....
Other	60.187.207	1,244,180	3,135,343	2,100,689
Total	135,943.715	2,810,206	3,205,343	2,147,589

In the table of the world's production of gold and silver in 1896, the gold product of Canada is placed at $2,810,206, representing 4,228 kilograms, fine, and its silver product at 3,205,343 ounces, or 99,718 kilograms, fine, of the coining value of $4,144,282, an increase of $899,306 in gold and of 1,429,660 ounces of silver as compared with 1895.

STRUCTURAL GEOLOGY OF THE GOLD AREA OF ONTARIO.[1]

The gold area of Ontario is of an almost unique kind. In many respects no other gold region can be compared directly with it, and the laws governing its auriferous deposits should be worked out for themselves. On this account it will be useful to sum up our present knowledge of its geology. There is perhaps no other large gold region confined to rocks of so ancient an age as the Archæan; and something should therefore be said as to the arrangement of these rocks. In general, the excellent work of Dr. Andrew C. Lawson, formerly of the Canadian Geological Survey, now of California University, may be accepted as laying the foundation of our knowledge both of Lake of the Woods and the Rainy Lake districts. The general principles worked out by him for these parts of the region are found to apply also to the Seine River, Manitou, and other more recently discovered districts.

As explained and mapped by Lawson, the region consists of Laurentine and Huronian rocks, the term Laurentian being used in a petrographical, not historical, sense, and the probable Huronian being called Keewatin. A group of more or less modified sedimentary rocks, consisting of sandstones, mica schists, and gneisses, Lawson names Couchiching and places beneath the Huronian; but as they are seldom or never gold bearing they require no further mention here.

As a usual thing the so-called Laurentian rocks, consisting chiefly of granite, granite gneiss, and syenite gneiss, form rounded areas half a mile to a number of miles in width, and inclosing them are great meshes of Keewatin (Huronian) schists and eruptives, generally green in color and basic in character, but sometimes pale and siliceous. Lawson has proved that the granitoid rocks push up as eruptive masses through the schists, nipping in the latter as synclinal folds with bedding having a steep dip away from the Laurentian. The Huronian rocks are chiefly eruptive flows and metamorphosed volcanic ashes, but sometimes water-worn conglomerates. At the junction of Laurentian and Huronian there is generally a strip of greatly disturbed territory where the granite or gneiss has floated off small or large blocks of the green rocks, or has pushed dikes of granite or felsite into fissures

[1] Extract from Sixth Report of the Bureau of Mines, 1896.

of the Huronian. Eruptive bosses of a later granite in many places penetrate both Laurentian and Huronian, and likewise send dikes into the adjoining rock.

This brief outline of the Archæan geology of the region will perhaps be sufficient as a groundwork in our present subject. It is evident from the sketch just given that the region was one of great disturbances during Archæan times, mountain building, earthquakes, and volcanic eruptions having been active, not alone in causing the general geological relationships which we now find, but also in opening up innumerable fissures to be filled with quartz and other minerals by circulating heated waters, thus forming the present ore deposits.

At a much later age the region, mountainous at the close of the Archæan, was worn down to an approximate plain, disclosing on an ice-smoothed surface the complicated arrangement of rocks and veins now so interesting to the geologist and prospector.

A more complete description of the geology may be found in the reports of the Geological Survey of Canada and in previous reports of the Bureau of Mines.

CLASSIFICATION OF THE GOLD DEPOSITS OF ONTARIO.[1]

There is a good deal of variety in the gold deposits of the Province, so that it will be desirable to discuss them under some regular classification, such as the following:

1. True fissure veins.
   - *a*. In granite and gneiss.
   - *b*. In Huronian massive or schistose rocks.
2. Bedded, lenticular, or segregated veins.
   - *a*. In gneissoid rocks.
   - *b*. In Huronian schists.
3. Contact deposits between granite or gneiss and Huronian rocks.
4. Fahlbands in Huronian schists.
5. Dikes of porphry or felsite with associated quartz, mainly in Huronian rocks.
6. Eruptive masses.
7. Placer deposits of Pleistocene age.

1. True fissure veins.

True fissure veins are most commonly found in the areas of eruptive granite and form important gold deposits in many cases, having a continuity and uniformity not usually found in the other types. The best known examples are those of Shoal Lake on Seine River, where an area of coarse granite six miles in length by one or two in breadth contains scores and perhaps hundreds of well defined veins running in various directions. The granite is of the green "protogine" variety, a very siliceous plagioclase or soda granite, in which there is much sericite, and it pushes up through Huronian rocks that had been greatly disturbed in ages long previous to the eruption. On the southeast side of the granite there is a schist conglomerate containing bowlders of a variety of rocks; on the northwest an area of white anorthosite, generally called gabbro. To the north green schist and diabase (trap) are found.

It is in this small area, discovered only about three years ago, that the rich veins of the Foley, Ferguson, Lucky Coon, and other mines are now being developed, and it is probable that another year will see a respectable output of gold from at least two of this group of mines. The veins may be expected to go to great depths, though at present the deepest shaft is down not much more than 200 feet.

The Sawbill mine on the lake of the same name, the Hawk Bay mine, and other locations in the Upper Seine River region, are illustrations of similar ore deposits, but in rock that has a gneissoid look and seems to belong to the older group generally classed Laurentian, while some veins of the Harold Lake mine are in greenish eruptive granite.

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[1] Extract from Sixth Report of the Bureau of Mines, 1896.

In part the main vein of the Regina mine on the Lake of the Woods should be classed here, since it starts in altered granite; but it soon passes into green altered diabase of the Huronian. The rich vein of the Mikado has the same association, starting in the granite but running into altered diabase.

The Ophir vein on Sultana Island, from which such showy specimens were obtained a few years ago, is in porphyritic gneiss, and the Crown reef of the Sultana cuts the edge of the same area of gneiss.

True fissure veins are much less common in the Huronian schists than in the granitoid rocks, as might be expected from their structure, which parts much more easily between the layers of schist than across them. Good examples are, however, to be found on the Crawford property, HP301, north of Lake Manitou, where a well-defined fissure vein 3 or 4 feet wide may be traced for a quarter of a mile or more across the strike of the schistose country rock, and a somewhat narrower one for a still greater distance.

Many of the fissure veins in the Huronian schists are narrow and very crooked and irregular, and they are often associated with larger bedded veins. In that case the narrow cross veins are generally much richer than the others. Examples of true fissure veins in talc schist, small but very rich, are to be found on J013, north of Seine River, a few miles east of Shoal Lake.

2. Bedded or lenticular veins.

The next variety of ore deposits, variously called bedded, lenticular, or segregated veins, belongs especially to schistose rocks, just as true fissure veins are chiefly confined to massive rocks. Bedded veins are interpolated between the schists, and run parallel with their strike. They are generally lenticular in shape, and when a lens runs out another often replaces it a little to one side. Frequently several layers of schist are more or less parted, bands of quartz of varying thickness filling the spaces between when the ore body may have quite ill-defined limits, but in many cases the lenses have tolerably definite walls, though seldom so distinct as in the case of true fissure veins. Bedded veins are sometimes, however, very like fissure veins, and the two kinds are not to be looked upon as totally different in character, since both must have been at one time open fissures through which water circulated. But they are not usually so continuous horizontally and vertically as true fissure veins, and the quartz is more often quartzitic in look than in the other classes.

The most interesting example of lenticular veins in our region is found at the Sultana mine, where a lens of considerable width was traced along shore for 1,800 feet, the country rock being a gray schist, probably formed by the shearing of a mass of porphyritic gneiss as it pushed up through Huronian rocks, the latter now largely removed. When the upper lens was about worked out Mr. Caldwell was so fortunate as to strike another very much larger body of quartz, hundreds of feet long and at some points 40 feet across, with a little schist included. This immense and rich ore body is probably a second, lower lens, though work enough has not yet been done to make its form certain. The ore here is of the quartzitic type.

I am not aware of any other bedded vein in Laurentia gneiss on which mining has been done, but veins of this description in Huronian rocks are by all means the commonest form of gold deposit in Ontario. They vary greatly in size, shape, and importance. Often one finds a great number of small crumpled stringers of quartz, with schist between the whole, uniting at some point, perhaps to larger quartz masses, but without any well-marked walls. An example of this kind is to be seen in the well-known Little America mine, on a small island just south of the border in Minnesota. In other cases there are well-defined bands of quartz with fairly good walls, and traceable even for miles. The Empress mine, near Jackfish Bay, and the other locations on the same being, furnish a good illustration of this; and the once famous Huronian mine, in Moss Township, is apparently on a similar vein. Many more or less promising ore deposits in the Little Turtle and Manitou regions have also the

same character, some of them containing exceedingly rich quartz, though up to the present none of them have been sufficiently worked to show their true value; and the same may be said of many bedded veins on or near the Lake of the Woods.

Besides vein-like or lenticular ore bodies, quite irregular masses of quartz occur in both Laurentian and Huronian, and a number of them have been proved to carry gold. We may include them, however, with bedded veins, with which they are frequently associated.

3. Contact deposits.

Contact deposits, extensive and valuable in some mining regions, are comparatively infrequent in ours, and none thus far found have proved valuable as mines. There is an interesting occurrence of the sort on Shoal Lake Narrows, location 188P, where a large mass of quartz with pyrite and dolomite is interposed between a boss of coarse red granite and greenish-gray Huronian schist. A very little work has been done here, not enough, however, to give much idea of the value of the property.

The Mikado and Regina veins are sometimes spoken of as contact deposits, but they can not properly be so classed, since the vein does not lie to any appreciable extent between granite and Huronian rocks, but in each case cuts across the contact, being inclosed at one end in granite and at the other in diabase, both being more or less regular fissure veins.

All the varieties of ore bodies thus far mentioned have the same essential character, having been deposited by circulating water in fissures or cavities.

4. Fahlbands.

Fahlbands, or bands of schist impregnated with pyrite and other sulphides, are not infrequent in the Huronian rocks of Ontario, and in some cases they have been proved to be auriferous. Frequently some quartz is embedded between the pyritous schists, forming a connecting link with certain bedded veins.

The best known of these deposits is one near Rossland, north of the Canadian Pacific, at Rat Portage. This runs northeast and southwest, including the Scramble, Benson, and other locations, is 27 feet wide in places, and it is stated has been traced several miles. The gold carried is very fine and is easily shown by panning.

Fahlbands occur also in the Manitou and Little Turtle regions, and at some points are rich in gold. Up to the present, however, no such deposit has been worked sufficiently to prove it a valuable mine, but it is very likely that some of them will be thoroughly tested next summer. They are often large enough to be of great importance if they carry even $3 or $4 per ton of free-milling gold.

5. Dikes of porphyry or felsite.

Wherever granite or gneiss comes in contact with Huronian rocks in western Ontario it is customary to find dikes of a finer grained porphyritic kind penetrating the schists, and sometimes also the granitic rock itself. In many cases these dikes are largely penetrated with seams and stringers of quartz, or have irregular masses of quartz between them and the country rock. The fissures now filled with quartz may have arisen from shrinkage of the dike rock while cooling, or the dike may have formed a line of weakness along which later fissures were made. The quartz thus associated with felsite or porphyry often carries gold. Examples of this are found near Rat Portage, at Camp Bay, and on the Manitou. Sometimes the dike rock itself shows colors on panning. Many locations have been taken up on dikes, but it still remains to be seen whether they will form workable deposits on any large scale.

6. Eruptive masses.

Very few eruptive bosses or masses have been shown to carry gold in our region, though in other countries they occasionally form valuable mines. The Treadwell mine in Alaska, for instance, works a mass of greatly metamorphosed granite, and

makes an excellent profit on rock averaging probably less than $3 per ton. The only locations of the kind in Ontario, so far as I am aware, are on Round Lake, near the Huronian mine. Here a considerably altered quartz porphyry contains iron and copper pyrites, a little fluor spar and other minerals, and has been found by Mr. Hille to assay from nothing up to $7 per ton. There are great possibilities in so vast a mass of gold-bearing rock, even if it should run very low in gold; but it has yet to be shown that any such rock mass will form a workable mine in Ontario.

7. Placer deposits.

Owing to the scouring effect of the glaciers of the ice age it is probable that no extensive placers will be found in Ontario, though a few local ones representing the post-glacial wear and tear of rich veins may turn out to have a limited value. The only one which has been at all worked is that of the "Swede Boys," near the south end of Upper Manitou. Here there is no water-worn gravel, but only swamp mud, with angular fragments of schist and quartz from the adjoining weathered hillside. This was worked for only a short time, with most primitive appliances, and yielded, it is said, only a few dollars' worth of gold.

General observations.

It was generally held some years ago that gold and other metals were to be looked for in Ontario only in the Huronian, the Laurentian being considered barren. During the last three years, however, the views of both geologists and prospectors have been changing. It has been found that some of the most promising gold deposits occur either in granite, as at Shoal Lake, or in gneiss, as on Sultana Island; and further, that both in granitoid rocks and the green Huronian schists the best veins or other ore deposits occur at or near the contact of the two kinds of rock. At first this was held true only of eruptive bosses of granite, but there is good evidence to show that the eruptive contact of gneiss areas is just as effective. Scarcely any promising mine is located more than a mile or two from such a contact and several of the best are just at the contact. Prospectors are generally familiar with this relationship and wherever there are geological maps you will find them carefully scanning the contact zones as shown on them.

There is no reason to suppose that the limits of our gold region have been reached. Traces of gold have been obtained within the last few weeks in assays of quartz obtained 50 or 100 miles north of Lake Wahmapitae, and wherever in the great tract toward Hudson Bay Laurentian and Huronian meet gold may be looked for hopefully. It is probable, too, that Huronian areas will be found within the great Laurentian stretch, as shown on our old maps, south of Lake Nipissing. In fact, the Hastings series of rocks in which the earliest finds of gold were made in Ontario should almost certainly be included in the Huronian, and there is no doubt that other areas occur. The rocks which inclose the gold-bearing vein of the McGowan mine near Parry Sound would be called Huronian in western Ontario.

The source of the gold deposits in our rocks is not easy to determine. The fact that they almost all occur near the contact of granitoid eruptive rocks with the Huronian suggests that one or other of these rocks furnished the original supply of gold, probably by lateral secretion. In the case of small and rich lenses we can not assume fissures reaching to great depths, so that the adjoining rocks must have contained the gold afterwards concentrated in fissures opened by the pushing up of granite masses into the Huronian schists. Gold has frequently been found in the country rock immediately beside veins, but probably this has been deposited from the solutions circulating in the veins themselves.

The auriferous fahlbands of the Huronian may have been supplied with the metal in the beginning, or they may represent shear zones where the rocks have been so shattered as to allow solutions to percolate and deposit sulphides with gold. The eruptive masses carrying gold almost certainly brought the metal up with them from the depths where they originated.

It is very desirable that unchanged country rocks of our gold veins should be carefully studied and analyzed on a scale large enough to determine the real source of the gold. The results might have considerable importance from the economic side, and would certainly be of much scientific interest.

LITHOLOGICAL AND STRATIGRAPHICAL NOTES.[1]

The great complication of the Archæan rocks of western Ontario make it impossible to give their relationship in detail on a small scale map, such as the geological map of the Lake of the Woods, 2 miles to the inch, and still more so on the Rainy Lake and other sheets covering 4 miles to the inch; nor could it be possible to trace all these details in a geological survey carried out rapidly with a small force over a large area, much of the time being necessarily devoted to topographical work as the foundation for geological coloring. It will therefore be no derogation from the really admirable work done by the members of the Geological Survey, Dr. Lawson, Messrs. Smith, McInnis, and others, to say that in many parts of western Ontario there are points of great interest still to be worked out, and that some of these points have a direct importance on the economic side as showing the associations in which the more important gold deposits are found.

In this portion of the report it is intended to take up especially the lithology of some of these points from the scientific rather than the economic side.

SULTANA ISLAND.[1]

The great gold-quartz lenses of the Sultana mine are found at the northwestern edge of an oval boss mapped by Lawson as Laurentian. The inclosing rock, mapped at Keewatin, is green, fine grained, and not distinctly schistose. The boss of Laurentian consists in its central part of coarse-grained gray granite, with phenocrysts of orthoclase half an inch wide. Going westward toward the edge of the boss the granite slowly becomes schistose, showing distinct parallelism of structure, and the porphyritic feldspars are rolled out into imperfect augen or lens-shaped portions. At the water's edge, near the Crown Reef, the coarse gray gneiss passes rapidly into fine-grained dark-gray gneiss of a very schistose kind, and then into a very fine-grained brown-black mica schist with crumpled strips or lenses of quartz. The contact with the Huronian is not shown here. The large quartz lenses in which the mine is worked lie in this schistose edge of the boss. The quartz is generally quartzitic in appearance, and contains many thin sheets or thicker bands of the dark schist.

Going northeast of the Crown Reef, the porphyritic granite passes into a coarse-grained granitoid rock of a darker gray color and not porphyritic. The latter rock sends arms into the Huronian, and occasionally forms a breccia with fragments of Huronian rock.

Many small dikes run out into the Huronian, some of an acid character and yellowish or whitish in color, others basic and dark green, gray, or black, usually somewhat porphyritic, Some of the lighter colored dikes cross the dark-gray granitic rock, but none were seen in the central porphyritic granite.

Under the microscope the porphyritic granite from the central part of the island is seen to consist of quartz, somewhat broken or with slightly undulatory extinction, microline, often with microperthitic inclusions of albite, plagioclase (oligoclase) having narrow twinning and low angles of extinction from the twin plane, and brown biotite. The plagioclase often shows fairly well-formed crystals. It is usually badly weathered. The porphyritic feldspars are mieroperthitic microline, and sometimes inclose small crystals of plagioclase. Of accessory minerals only titanite and apatite were noticed. An analysis of this rock was made by Mr. R. M. Rose-

[1] Extract from Sixth Report of the Bureau of Mines, 1896.

brugh in the chemical laboratory of the School of Science, for which I here express my thanks. The results are as follows:

	Per cent.
SiO_2	69.80
Al_2O_3	14.53
Fe_2O_3	5.35
FeO	
MnO	0.06
CaO	3.17
MgO	1.72
K_2O	4.37
Na_2O	2.87
TiO_2	0.05
P_2O_5	0.06

The analysis shows that the granite is of a rather basic type, as one would expect from the considerable amount of oligoclase present in it.

As one approaches the Crown reef at the western margin of the boss parallelism of the constituents of the porphyritic granite shows itself, and the signs of crushing and shearing grow intense. The quartz shows "mortar" structure, being crushed into fine particles inclosing larger fragments. The felspars are broken and portions shifted asunder, calcite sometimes serving as cement. The plagioclases are so completely weathered into a confused saussuritic mass that the twinning is almost lost and the microline becomes turbid and often filled with sericite. At the very edge the quartz is rolled out into streaks of crushed particles, the felspar largely changed into a mixture of sericite and brown mica, and calcite and sulphides appear in considerable quantities. At the extreme edge little is to be seen in thin sections but brown biotite in minute scales. It may be that the almost black mica schist at the edge represents a modified margin of the basic Huronian rock in contact with the granite boss.

The dark gray granitic rock into which the porphyritic granite seems to pass toward the north before the green Huronian is reached proves under the microscope to be quartz mica diorite. The quartz was the last mineral to crystallize, is not present in large quantities, and commonly shows a pegmatitic intergrowth with plagioclase. No orthoclase was recognized, and the plagioclase, judging by the angle of extinction from twin planes, is rather basic labradorite. It commonly has a tendency to idiomorphy, and is crowded with dusty particles and short dashes. Brown biotite like that of the adjoining granite is the chief dark mineral. Some confused masses of epidote and chlorite may represent vanished augite. Magnetite and apatite occur as accessory minerals.

As this rock differs so greatly from the granite, showing few signs of strain and being rather basic, it should perhaps be looked on as forming a distinct eruption, though its edge toward the granite is indefinite, suggesting a transition. The fact that acid dikes penetrate this rock but have not been seen in the granite, from which they probably originated, makes it probable that the granite was pushed up later than the diorite, probably in a plastic rather than liquid state.

Dikes of both acid and basic rock are common in the green Huronian adjoining the porphyritic granite and quartz diorite. The acid dikes vary from a few feet to a few inches in width, and sometimes form breccias containing sharp-angled fragments of the green rock. They are pale greenish-gray to flesh red in color and usually medium in grain. The two thin sections examined contain much quartz, somewhat broken or undulatory in extinction, a small amount of weathered microline, and a large quantity of oligoclase, much of it idiomorphic. The only dark minerals are a small quantity of biotite and chlorite. These rocks look like granite and should probably be called plagioclase granite, though closely related to the quartz diorites.

The basic dikes are dark gray, almost black, in color, and either porphyritic with a fine-grained groundmass or closely like the quartz diorite previously described.

A greenish-gray dike rock in which the porphyritic plagioclases are of the same color as the groundmass is in structure a porphyritic gabbro. The felspars are often idiomorphic, both in the groundmass and as phenocrysts, are short, stout, and at times zonally built up, the larger ones being generally very complicatedly twinned. Extinction angles indicate bytownite as the felspar. A little diallage remains, surrounded with greenish, ragged hornblende, but most of the augite has disappeared. A small quantity of brown biotite is seen, filled with rutile needles. Two other dikes have a speckled appearance from the white phenocrysts of plagioclase. The groundmass in these is micro-granitic and consists of quartz, plagioclase, and hornblende. The porphyritic crystals are well formed and are, partly at least, labradorite. In one of the dike rocks rounded composite masses of green hornblende probably represent porphyritic augite. These rocks should probably be named diorite porphyrite.

The dark-green fine-grained Huronian rock adjoining the eruptive boss is evidently a greatly changed eruptive, showing no distinct schistose structure. It contains a plagioclase, epidote, and dull-green, confused hornblende. The lath-like forms of the still recognizable plagioclase and the presence of remnants of augite show that it is diabase.

Half or three-quarters of a mile south of the Sultana mine is the Ophir, which appears to be on a fissure vein in the porphyritic granite. A small opening was made on this vein years ago, resulting in the finding of the richest nuggety quartz yet obtained in western Ontario. On the dump near the vein there is a brown-black fine-grained biotite schist very similar to that near the Crown reef. This appears, however, to occur in the vein rather than as a wall rock.

The ore bodies of importance found on and near Sultana Island include two fissure veins, the Ophir vein and the Crown reef, and two lenses, the upper one on which the Sultana mine first worked and the immense lower ore body on which work is now being done. It is probable that the rich body of quartz said to have been discovered by the diamond drill under the bay near the Sultana is a continuation of the lower lens, though it may be a distinct lens. It will be noted that all these veins are in the schistose edge of the porphyritic granite. It may be imagined that the granite, while still somewhat plastic, i. e., not yet cooled to the point of consolidation, pushed up through the Huronian rocks, more or less shattering them and dragging out its own margin into the present schistose form. Before the process was complete the sheared edge of the mass was solid enough to allow the formation of great cavities between the layers of gneiss and mica schist. Here the fluids of the now solid but still hot granite could circulate, depositing the auriferous quartz.

It seems likely that the dikes of granite and porphyry penetrated the Huronian diabase at an early stage, when portions of the interior of the granite magna were still fluid. No plegmatic dikes were found on Sultana Island. Up to the present no gold-bearing lenses have been found on the southern, southeastern, or northeastern sides of the Sultana granite boss; nor have similarly arranged ore bodies been found at the margin of other areas of so-called Laurentian. It would be surprising, however, if the example above described should turn out to be alone of its kind.

BRITISH COLUMBIA.

According to the annual report of the minister of mines for the year ending December 31, 1896, the total production since 1858 was:

Placer gold	$57,704,855
Lode gold	2,177,869
Silver	4,028,224

Half the placer production was obtained between 1858 and 1868. The largest extraction was in 1863, when the Cariboo mines produced $3,913,563. Since then the production continually decreased until 1893,

when it was only $356,131. Since then it has increased, owing to the erection of hydraulic works for the washing of auriferous sands in the environs of Barkeville and Quesnelle. The production of gold is expected to grow in these districts from year to year. In 1893 the gold extracted in the region was $23,404; in 1896 it rose to $1,244,180. This is the production of the Rossland mines almost exclusively, the Camp McKinney and the Poorman mines of Nelson having produced scarcely anything.

The extraction of silver has progressed during the last six years. In 1887 the output of silver was 17,690 ounces of the value of $17,331; in 1896 it was 3,135,343 ounces of the commercial value of $2,100,689.

[Extracts from Eighteenth Annual Report of the British Columbia Board of Trade, Victoria, British Columbia, 1897.]

In the Trail subdivision over 175 claims are being worked and five have developed into mines from which regular shipments of ore are made. The quartz, carrying gold and copper, is mostly found under an iron capping, and hitherto it has been necessary to do considerable work before reaching pay ore. This accounts for the small number of shipping mines when compared with the number of claims being worked. There are enormous quantities of low-grade ore which can not be profitably handled at present, owing to the high rates for transportation and treatment, costing together from $10 to $14 per ton. It is expected, however, that these difficulties will be partially overcome by the erection of smelters nearer the mines, and the cheap fuel which will be available as soon as the Crow's Nest Pass Railway is in operation.

A very interesting experiment was recently made with 10 tons of siliceous ore containing $16 per ton in gold. In milling and concentrating 65 per cent was saved. The surface indications of the Trail subdivision claims are rarely very promising, but the ore is usually found to increase in value with depth and often the veins widen. The average value of the ore shipped from Trail mines may be taken at $40 per ton.

Rossland, the center of the subdivision, is now tapped by two railways. The Columbia and Western, 11½ miles long, terminates at Trail, on the Columbia River. The Red Mountain Railway gives Rossland and some of the principal mines adjacent direct communication with two United States trunk lines. Trail ores are now treated at smelters on Puget Sound, and in Montana, Colorado, and other United States points.

The Nelson subdivision of West Kootenay is not so well advanced as Trail, but there is promise of considerable mining development in the immediate future. During 1896 2,544 mineral locations were recorded, and many of these are now being worked. The recent discoveries are varied in character, some being similar to the Trail ores and others are gold-silver quartz with galena. They lie principally south of the town of Nelson, in the Salmon River country, through which the Nelson and Fort Sheppard Railway runs.

In the Ainsworth subdivision the mines, excepting the Blue Bell, show an increase in output.

The Slocan subdivision has made a remarkable record. Its area does not exceed 15 by 25 miles, and silver-galena ore was only discovered there in 1891. At present this subdivision contains about 50 mines from which regular shipments of ore are made. The average of that shipped during 1896 contained 117 ounces of silver per ton and 52 per cent of lead, and is estimated to have returned the mine owners a net profit of $75 per ton. Slocan is often spoken of as the "poor man's mining camp." The veins being mostly situated on steep mountains can be worked by tunnels, and very little capital has been necessary to place the properties on a paying basis.

Railways connect this subdivision with the Columbia River and Kootenay Lake, on each of which there is a daily service between the Canadian Pacific Railway at Arrowhead and the United States systems at Nelson and Bonner's Ferry.

East Kootenay has not yet received so much attention as the country adjoining on the west, the natural advantages for transportation not being equal. There is abundant evidence, however, that this section is rich in gold, silver, lead, and copper, and the assured early construction of the Crow's Nest Pass Railway has already given an impetus to mining development. There are very extensive deposits of coal along the proposed line of railway, which at present can not be profitably marketed, and the benefits which the Crow's Nest Pass Railway will confer upon the mining camps referred to can hardly be overestimated. Cheap fuel, coal, and coke will make it possible to treat enormous quantities of low-grade ores which now lie undisturbed. The increased competition in all kinds of supplies which will follow the opening of the new railway will also materially assist the cheaper mining of all grades of ores.

Passing on to Boundary Creek, situated near the United States boundary in the District of Yale, we find very important mining works in progress. Previous to January 1, 1895, only 370 claims have been registered, but during the following twelve months and during 1896 771 and 1,279 new claims were recorded, respectively. The ores mostly carry gold, and already many rich deposits have been discovered, but the great cost of transportation, 60 or more miles haulage by wagon, has retarded extensive operations.

Before proceeding further it will be found instructive to follow the developments embraced in the area referred to. The first shipments of ore were from mines near Nelson and Ainsworth, situated conveniently near the great natural waterway afforded by Kootenay Lake. Shortly after rich ore deposits were found in the Slocan; so rich were these discoveries that only a year passed before railways were projected which gave the Slocan mining camps connection with lakes and rivers on the east and west.

The general public was scarcely aware of the value of these silver-lead locations when the copper-gold deposits near Rossland were heralded forth. Upon the wealth of this country being demonstrated two railways were almost immediately projected and now place Rossland within easy reach of the outside world. In the meantime the great crowd of prospectors had dispersed to new regions, to fields farther removed from natural waterways, and in some cases so remote that ore averaging $100 per ton could hardly be handled at a profit. In East Kootenay many such properties will be placed on a paying basis by the opening of the Crow's Nest Pass Railway. In the Boundary Creek country a similar result may be expected upon the opening of the projected railway between Penticton and Rossland, and after the prospectors have more thoroughly examined the country which these railways will traverse other districts in turn will receive their attention.

Yale and Lillooet districts have already furnished evidence of great mineral wealth.

In the Cariboo district large sums of money have been expended upon mining works, principally hydraulic. These workings suffered during 1896, the season being the driest ever known, and not many of the claims were operated more than a few weeks.

Mining by hydraulic elevators is being successfully carried on, but river dredging is still in the experimental stage.

Great efforts, costing large sums of money, are being made to reach the bottom of deep channels of creeks, the surfaces of which were worked some thirty years since.

These placer claims furnished work for hundreds of men at wages from $8 to $10 per day, but the bottoms of the deep channels were not reached. This is now being effected by shafts and tunnels, and some idea of the magnitude of the work may be judged from the experience of a company engaged in these creek diggings. Bed rock in the channel is ascertained to be 100 feet from the surface of the ground, but in order to reach it it has been found necessary to sink and run about 1,500 feet shafts and tunnels.

A theory has lately been evolved that the earlier waterways of Cariboo were different from those which now exist. This has led to prospecting in what are believed to be dry beds of former rivers and creeks, and it is reported that immense quantities of gold-bearing gravel have been located. It is hoped that before this is in print we may be in a position to give further particulars regarding these late discoveries.

Both placer and quartz mining received more than usual attention during the year 1896, and it has been ascertained that large bodies of ore will yield satisfactory to the cyanide treatment.

In the Omenica subdivision preparations are being made for hydraulic workings. The gravel must be very rich to induce the companies to pay over $300 per ton freight on the plant and work in a country where it costs $12.50 to place a 50-pound sack of flour.

The future of Cariboo depends upon cheaper transportation, and as soon as the building of the railway between Bute Inlet and Quesnelle is assured greatly increased activity may be expected in Cariboo in all kinds of mining.

Immediately north of Cariboo is the district of Cassiar, an immense country, very little prospected. Several of the waterways have afforded rich placer diggings.

It is hardly within the scope of this report to do more than mention the Yukon gold fields which lie north of Cassiar in the northwest territory of Canada. The latest excitement resulted from discoveries on the Klondike River and tributaries. Some of these are reported by old miners to equal California in early days in richness. It is believed that this mineral belt extends to Cassiar, and that the whole of the divide will be found to be rich in gold.

Some prospecting has been done in the Coast district, but it has been principally confined to the inlets and points easy of access by water. Specimens from such locations have assayed well, but the owners of the claims seldom have the means for carrying on extensive development.

In consequence of the numerous attractions in the interior (especially in Kootenay), it is not easy to get men with capital to give claims on the coast and islands of British Columbia the attention they undoubtedly deserve. Many of these being close to navigable waters the ores can be transported at a small cost to the smelters. The principal quartz developments are being made on claims situate on Texada Island, and from one of these mines shipments have been made for several months past. Other properties on the north of Texada Island will soon be in a position to commence shipping. All the ores carry gold and some of it is free milling. Claims on Valeds Island are also being worked with encouraging results.

Queen Charlotte Island is known to be rich in minerals—gold, silver, iron, and copper. Coal of excellent quality has been found near navigable water.

On Vancouver Island, especially on the west coast, prospecting is being actively prosecuted and immense bodies of quartz carrying copper and gold have recently been located. Many claims are being worked, but no important shipments of ore have yet been made. The owners interested in these development works are most sanguine as to the value of their respective claims, and assert that only capital is required to establish many paying mines.

YUKON.

Attention has already been directed to the richness of the Yukon placer gold mines. Persons interested in them should read the reports lately made to the Dominion Government by Mr. William Ogilvie, land surveyor. There has been a great rush of miners to that country, and many are kept back only on account of transportation difficulties. These difficulties it is expected will soon be overcome by the opening up of one or more of the routes previously mentioned, and a very large trade may be expected to result. At present the trade of the Yukon is principally in the hands of United States merchants.

The loss of duty which might be collected on miners' outfits and supplies going in via the White and Dyea passes is a very serious one to the Dominion. Customs officers should be stationed there and at the entrance to Canadian territory by each of the other routes.

It is hoped to append hereto a small sketch map showing these gold fields and those of Cassiar and Cariboo, with the position of the cities of this province as a supply base.

In consequence of the many attractions nearer home British Columbia merchants have not yet fully realized the trade possibilities with the Yukon.

MINING STATISTICS.

[Report of minister of mines, December 31, 1896.]

Total production for all years.

Gold:	
Placer	$57,704,855
Lode	2,177,869
Silver	4,028,224

PLACER GOLD.

Table V gives the yearly production of placer gold as determined by the returns sent in by the banks and express companies of gold sold to the mints, and from returns sent in by the gold commissioners and mining recorder. To these yearly amounts one-third was added up to the year 1878, and from then to 1895 one-fifth, which proportion was considered to represent approximately the amount of gold sold of which there was no record.

The gold output is now beginning to steadily rise as the operations of the large hydraulic mining companies in Cariboo begin to assume such a scale, that with larger water supplies and the mines more opened out for work, a much larger amount of ground can be washed.

This placer gold contains from 10 to 25 per cent silver, but the silver value has not been separated from the totals.

TABLE V.—YIELD OF PLACER GOLD PER YEAR TO DATE.

1858	$705,000	1879	$1,290,058
1859	1,615,070	1880	1,013,827
1860	2,228,543	1881	1,046,737
1861	2,666,118	1882	954,085
1862	2,656,903	1883	794,252
1863	3,913,563	1884	736,165
1864	3,735,850	1885	713,738
1865	3,491,205	1886	903,651
1866	2,662,106	1887	693,709
1867	2,480,868	1888	616,731
1868	3,372,972	1889	588,923
1869	1,774,978	1890	490,435
1870	1,336,956	1891	429,811
1871	1,799,440	1892	399,526
1872	1,610,972	1893	356,131
1873	1,305,749	1894	405,516
1874	1,844,618	1895	481,683
1875	2,474,004	1896	544,026
1876	1,786,648		
1877	1,608,182	Total	57,704,855
1878	1,257,204		

PRODUCTION OF LODE MINING.

The next table shows very clearly the fact that lode mining in this province has just fairly begun, and that the progress now being made is decided and very satisfactory.

The gold production of course consists mostly of the output of Rossland mines as per smelter returns, but there are added the gold saved by amalgamation in the Osoyoos district, as at Camp McKinney; in the Nelson district, as at the Poorman mine, and the product of small lots of gold ore sent out to the smelters from other parts.

Some silver ore is known to have been sold prior to 1887, but no record has been obtained regarding these small sales.

TABLE VI.—PRODUCTION OF LODE MINES.

Year.	Gold.		Silver.	
	Quantity.	Value.	Quantity.	Value.
	Ounces.		*Ounces.*	
1887	.....	.....	17,690	$17,331
1888	.....	.....	79,780	75,000
1889	.....	.....	53,192	47,873
1890	.....	.....	70,427	73,948
1891	.....	.....	4,500	4,000
1892	.....	.....	77,160	66,935
1893	1,170	$23,404	227,000	195,000
1894	6,252	125,014	746,379	470,219
1895	39,264	785,271	1,496,522	977,229
1896	62,259	1,244,180	3,135,343	2,100,689
Total	108,945	2,177,869	5,907,993	4,028,224

Year.	Lead.		Copper.		Total value.
	Quantity.	Value.	Quantity.	Value.	
	Pounds.		*Pounds.*		
1887	.....	.....	.....	.....	$17,331
1888	.....	.....	.....	.....	75,000
1889	.....	.....	.....	.....	47,873
1890	113,000	$5,805	.....	.....	79,753
1891	588,665	25,607	.....	.....	29,607
1892	1,768,420	72,505	.....	.....	139,440
1893	2,135,023	78,996	.....	.....	297,400
1894	5,662,523	169,875	324,680	$16,234	781,342
1895	16,475,464	532,255	952,840	47,642	2,342,397
1896	24,199,977	721,384	3,818,556	190,926	4,257,179
Total	50,943,072	1,606,427	5,096,076	254,802	8,067,322

KLONDIKE AND NORTHERN GOLD FIELDS.

[Extracts from Mr. Ogilvie's reports to the Dominion Government.]

William Ogilvie, of the department of the interior, in his report to the surveyor-general of Canada, dated November 6, 1896, says the name Klondak, Klondyke, or Clondyke, as it is variously spelled, is "a mispronunciation of the Indian word or words Thron-dak or Duick," which means "plenty of fish," from the fact that it is a famous salmon stream. It is marked Tondack on old maps. It joins the Yukon from the east a few miles above the site of Fort Reliance.

Concerning the discovery of gold on this stream, he says:

The discovery, I believe, was due to the reports of Indians. A white man, named G. W. Carmach, who worked with me in 1887, was the first to take advantage of the

rumors and locate a claim on the first branch, which was named by the miners Bonanza Creek. Carmach located here late in August, but had to cut some logs for the mill here to get a few pounds of provisions to enable him to begin work on his claim, the fishing at Klondak having totally failed him. He returned with a few weeks' provisions for himself, his wife and brother-in-law (Indians) and another Indian in the last days of August, and immediately set about working his claim. As he was very short of appliances he could only put together a rather defective apparatus to wash the gravel with. The gravel itself he had to carry in a box on his back from 30 to 100 feet.

Notwithstanding this, the three men, working very irregularly, washed out $1,200 in eight days, and Carmach asserts with reason that had he had proper facilities it could have been done in two days, besides having several hundred dollars more gold, which was lost on the tailings through defective apparatus. On the same creek two men rocked out $75 in about two hours, and it is asserted that two men in the same creek took out $4,008 in two days with only two lengths of sluice boxes. This last is doubted, but Mr. Leduc assures me he weighed that much gold for them, but it is not positive where they got it. They were newcomers and had not done much in the country, so the probabilities are they got it on Bonanza Creek. A branch of Bonanza, named Eldorado, has prospected magnificently, and another branch, named Tilly Creek, has prospected well. In all there are some four or five branches to Bonanza Creek which have given good prospects. There are about 170 claims staked on the main creek, and the branches are good for about as many more, aggregating, say, 350 claims, which will require over 1,000 men to work properly.

A few miles farther up Bear Creek enters Klondak, and it has been prospected and located on. Compared with Bonanza it is small, and will not afford more than 20 or 30 claims, it is said.

About 12 miles above the mouth of Gold Bottom Creek joins Klondak, and on it and a branch named Hunker Creek, after the discovery, very rich ground has been found. One man showed me $22.75 he took out in a few hours on Hunker Creek with a gold pan, prospecting his claim on the surface, taking out a panful here and there, as fancy suggested. On Gold Bottom Creek and branches there will probably be 200 or 300 claims. The Indians have reported another creek much farther up, which they call Too Much Gold Creek, on which the gold is so plentiful that, as the miners say in joke, "You have to mix gravel with it to sluice it." Up to date nothing definite has been heard from this creek.

From all this we may, I think, infer that we have here a district that will give 1,000 claims of 500 feet in length each. Now, 1,000 such claims will require at least 3,000 men to work them properly, and as wages for working in the mines are from $8 to $10 per day, without board, we have every reason to assume that this part of our territory will in a year or two contain 10,000 souls at least, for the news has gone out to the coast and an unprecedented influx is expected next spring; and this is not all, for a large creek, called Indian Creek, joins the Yukon about midway between Klondak and Stewart River, and all along this creek good pay has been found. All that has stood in the way of working it heretofore has been the scarcity of provisions and the difficulty of getting them up there even when here. Indian Creek is quite a large stream, and it is probable it will yield 500 or 600 claims. Further south yet lies the head of several branches of Stewart River, on which some prospecting has been done this summer and good indications found, but the want of provisions prevented development. Now, gold has been found in several of the streams adjoining Pelly River, and also along the Hootalinqua. In the line of these finds farther south is the Cassiar gold field, in British Columbia, so that the presumption is that we have in our territory, along the easterly watershed of the Yukon, a gold-bearing belt of indefinite width and upward of 300 miles long, exclusive of the British Columbia part of it. On the easterly side of the Yukon prospecting has been done on a creek a short distance above Selkirk, with a fair amount of success, and on a large creek, some 30 or 40 miles below Selkirk, fair prospects have been found, but, as before remarked, the difficulty of getting supplies here prevents any extended prospecting.

Dalton informed me he has found good prospects on a small creek nearly midway between the Coast Range and Selkirk on his route. His man showed me some coarse gold, about a dollar's worth, he found on the head of a branch of the Aetsek River, near the head of Chilcat Inlet, which is, of course, inside the summit of the Coast Range and, of course, in our territory. From this you will gather that we have a very large area, all more or less gold-bearing, and will all yet be worked.

Good quartz has been found in place just across the line, on Davis Creek (see my map on the one hundred and forty-first sent you), but of what extent is unknown, as it is in the bed of the creek and covered with gravel. Good quartz is also reported on the hills around Bonanza Creek, but of this I will be able to speak more fully after my proposed survey. It is pretty certain, from information I have got from prospectors, that all or nearly all of the northerly branch of White River is on our side of the line, and copper is found on it, but more abundantly on the southerly branch, of which a great deal of it is in our territory also. So it is probable we have that metal, too. I have seen here several lumps of native copper brought by the natives from White River, but just from what part is uncertain. I have also seen a specimen of silver ore said to have been picked up in a creek flowing into Bennet Lake, about 14 miles down it on the east side.

Before closing I may say that every report that comes in from Bonanza Creek is more encouraging than the last. Prospecting has only begun, and up to the date of mailing, November 22, very rich prospects have been found on the few claims prospected on. From $1 to the pan of dirt up to $12 are reported, and no bedrock found yet. This means from $1,000 to $12,000 per day per man sluicing. The excitement is intense, but at this season of the year it is naturally very local.

Writing on December 9, 1896, Mr. Ogilvie says:

Since my last the prospects on Bonanza Creek and tributaries are increasing in richness and extent, until now it is certain that millions will be taken out of the district in the next few years. On some of the claims prospected the pay dirt is of great extent and very rich. One man told me yesterday that he washed out a single pan of dirt on one of the claims on Bonanza and found $14.25 in it. Of course that may be an exceptionally rich pan, but $5 to $7 per pan is the average on that claim, it is reported, with 5 feet pay dirt and the width yet undetermined, but it is known to be 30 feet. Even at that figure, the result at nine or ten pans to the cubic foot and 500 feet long is nearly $4,000,000 at $5 per pan. One-fourth of this would be enormous.

Another claim has been prospected to such an extent that it is known there is about 5 feet pay dirt, averaging $2 per pan, and [a width of] not less than 30 feet. Enough prospecting has been done to show that there are at least 15 miles of this extraordinary richness, and the indications are that we will have three or four times that extent; if not all equal to the above, at least very rich.

On January 11, 1897, he wrote:

The reports from the Klondak region are still very encouraging; so much so that all the other creeks around are practically abandoned, especially those on the head of Forty Mile, in American territory, and nearly 100 men have made their way up from Circle City, hauling their sleds themselves, many of them. Those who can not get their claims are buying in on those already located. Men can not be got to work for love or money, and development is consequently slow; $1.50 per hour is the wages paid the few men who have to work for hire, and work as many hours as you like. Some of the claims are so rich that every night a few pans of dirt suffice to pay the hired help, when there is any. As high as $204 has been reported to a single pan, but this is not generally credited. Claim owners are now very reticent about what they get, so you can hardly credit anything you hear; but one thing is certain, we have one of the richest mining areas ever found, with a fair prospect that we have not yet discovered its limits.

Miller and Glacier creeks, on the head of Sixty Mile River, which my survey of the one hundred and forty-first meridian determined to be in Canada, were thought to be very rich, but they are poor, both in quality and quantity, compared with Klondak. Chicken Creek, at the head of Forty Mile, in Alaska, discovered a year ago, and rated very high, is to-day practically abandoned.

January 21, 1897:

There are applications in for about 380 acres of land on the flat north of the Klondak, on the east side of the Yukon, while all the extent of land available for use on it is about 200 acres. Joseph Leduc, who applied for 160, has only about 110 available for use in building on, the rest being steep hillside, and the most of the flat is a moss-covered swamp. He had laid out and disposed of a few lots for building on in it, making his streets only 50 feet wide, and the main streets along the river even less, the builders going often close to the bank for convenience in getting water. But I stopped all that, and have the river front at least 66 feet wide; in most places much more. All streets parallel to the river are 66 feet and all at right angles to those I have left at 50, as Leduc had them. It seems to me that 50 feet is wide enough in this country, as it is hardly likely there will be much heavy traffic on them. Had I made the streets running from the river 66 feet wide, it would have put a good many people to much inconvenience. I will send out by the next mail a sketch showing the position of all the applications so far.

The American Government has given a contract for four mails this winter to Circle City, at $1,700 each mail, in and out. The mail carriers will take out letters at $1 each.

January 22, 1897:

A quartz lode showing free gold in paying quantities has been located on one of the creeks, but I can not yet send particulars. I am confident, from the nature of the gold found in the creeks, that many more of them, and rich, too, will be found.

January 23:

I have just heard from a reliable source that the quartz mentioned above is rich, as it tested over $100 to the ton. The lode appears to run from 3 to 8 feet in thickness, and is about 19 miles from the Yukon River. I will likely be called on to survey it, and will be able to report fully.

Placer prospects continue more and more encouraging and extraordinary. It is beyond doubt that three pans of different claims on Eldorado turned out $204, $212, and $216, but it must be born in mind that there was only three such pans, though there are many running for $10 to $50.

I have just received a petition from the miners to attend to the survey of their claims, they doing all the work and boarding and lodging me. I will begin at it in about ten days, and it will likely take me upward of two months. I am glad to have the opportunity of doing it, for I think I can considerably, if not altogether, straighten out the tangle there is there.

PLACER MINING.

Placer mining along the Yukon River and its tributaries in the northwest territories is regulated as follows:

"Bar diggings" mean any part of a river over which the water extends when the river is in its flooded state, and which is not covered at low water.

Mines on branches are known as "bench diggings" for the purpose of defining the size of such claims from dry diggings.

"Dry diggings" mean any mine over which a river never extends.

NATURE AND SIZE OF CLAIMS.

"Bar diggings," a strip of land 100 feet wide at high-water mark, and thence extending into the river to its lowest water level.

The sides of a claim for bar diggings are two parallel lines run as nearly as possible at right angles to the stream and marked by four legal posts, one at each end of the claim at or about high-water mark, also one at each end of the claim at or about the edge of the water. One of the posts at high-water mark must be legibly marked with the name of the miner and the date upon which the claim was staked.

Dry diggings are 100 feet square, and must have placed at each of the four corners a legal post, upon one of which shall be legibly marked the name of the miner and the date upon which the claim was staked.

Creek and river claims are 100 feet long, measured in the direction of the general course of the stream, and extending in width from base to base of the hill or bench on each side; but when the hills or benches are less than 100 feet apart, the claim may be 100 feet in depth. The sides of a claim must be two parallel lines run as nearly as possible at right angles to the stream. The sides must be marked with legal posts at or about the edge of the water and at the rear boundaries of the claim. One of the legal posts at the stream must be legibly marked with the name of the miner and the date upon which the claim was staked.

A bench claim is 100 feet square, and must have placed at each of the four corners a legal post upon which is legibly marked the name of the miner and the date upon which the claim was staked.

Entry is only granted for alternate claims, the other alternate claims being reserved for the Crown, to be disposed of at public auction or in such manner as may be decided by the minister of the interior.

The penalty for trespassing upon a claim reserved for the Crown is immediate cancellation by the gold commissioner of any entry or entries which the person trespassing may have obtained, whether by original entry or purchase, for a mining claim, and the refusal by the gold commissioner of the acceptance of any application which the person trespassing may at any time make for a claim. In addition to such penalty, the mounted police, upon a requisition from the gold commissioner to that effect, take the necessary steps to eject the trespasser.

In defining the size of claims they are measured horizontally, irrespective of inequalities on the surface of the ground.

If any person or persons discover a new mine, and such discovery is established to the satisfaction of the gold commissioners, a creek-and-river claim 200 feet in length may be granted.

A new stratum of auriferous earth or gravel, situated in a locality where the claims are abandoned, shall for this purpose be deemed a new mine, although the same locality shall have been previously worked at a different level.

An entry fee of $15 is charged for the first year, and an annual fee

of $15 for each of the following years. This provision applies to locations for which entries have already been granted.

A royalty of 10 per cent on the gold mined is levied and collected by officers appointed for the purpose, provided the amount so mined and taken from a single claim does not exceed $500 per week. In case the amount mined and taken from any single claim exceeds $500 per week, there is levied and collected a royalty of 10 per cent upon the amount so taken out up to $500, and upon the excess, or amount taken from any single claim over $500 per week, there is levied and collected a royalty of 20 per cent.

Default in payment of such royalty, if continued for ten days after notice has been posted upon the claim in respect of which it is demanded or in the vicinity of such claim by the gold commissioner or his agent, is followed by cancellation of the claim. Any attempt to defraud the Crown by withholding any part of the revenue thus provided for by making false statements of the amount taken out is punished by cancellation of the claim in respect of which fraud or false statements have been committed or made. In respect of the facts as to such fraud or false statements or nonpayment of royalty the decision of the gold commissioner is final.

FORM OF APPLICATION FOR GRANT FOR PLACER MINING AND AFFIDAVIT OF APPLICANT.

I (or we) ———, of ———, hereby apply, under the Dominion mining regulations, for a grant of a claim for placer mining, as defined in the said regulations, in (here describe locality) ———, and I (or we) solemnly swear:

1. That I (or we) have discovered therein a deposit of (here name the metal or minerals) ———.

2. That I (or we) am (or are), to the best of my (or our) knowledge and belief, the first discoverer (or discoverers) of the said deposit; or—

3. That the said claim was previously granted to (here name the last grantee), but has remained unworked by the said grantee for not less than ———.

4. That I (or we) am (or are) unaware that the land is other than vacant Dominion land.

5. That I (or we) did, on the —— day of ———, mark out on the ground, in accordance in every particular with the provisions of the mining regulations for the Yukon River and its tributaries, the claim for which I (or we) make this application, and that in so doing I (or we) did not encroach on any other claim or mining location previously laid out by any other person.

6. That the said claim contains, as nearly as I (or we) could measure or estimate, an area of ——— square feet, and that the description (and sketch, if any) of this date hereto attached, signed by me (or us) sets (or set) forth in detail, to the best of my (or our) knowledge and ability, its position, form, and dimensions.

7. That I (or we) make this application in good faith, to acquire the claim for the sole purpose of mining, to be prosecuted by myself (or us) or by myself and associates or by my (or our) assigns.

——— ——— [signature].

Sworn before me at ——— this —— day of ———, 18—.

YUKON AND KLONDIKE.[1]

The Yukon district comprises, generally speaking, that part of the Northwest Territories lying west of the watershed of the Mackenzie River and east of the one hundred and forty-first degree meridian, which divides the United States Territory of Alaska from Canada. The Arctic Ocean bounds the district on the north and the sixtieth parallel of latitude on the south, separating it from British Columbia. The district has an area of 192,000 square miles, or about the size of France, and of this area 150,768 square miles are included in the watershed of the Yukon River. The region as a whole is naturally mountainous in character, but it comprises as well a large area of merely hilly or gently rolling country, besides many wide and flat-bottomed valleys. It is more mountainous in the southeast, and subsides generally and uniformly to the northwestward, the mountains becoming more isolated and separated by broader tracts of low land. The average base level may be stated at a little over 2,000 feet.

The Yukon River provides the main drainage of the region. This river passes from Canadian into American territory at a point in its course 1,600 miles from the sea. The 200 miles of its course in Canada receives the waters of all the most important of its tributaries—the Stewart, Macmillan, Upper Pelly, Lewes, White River, etc.—each with an extensive subsidiary river system, which, spreading out like a fan toward the northeast, east, and southeast facilitate access into the interior. The first people from civilization to enter the country were the traders for the Hudson Bay Company, in the year 1840. In 1887 the Canadian Government authorized the organization of an expedition having for its object the exploration of the region of the Northwest Territories of Canada drained by the Yukon. The work was intrusted to Dr. G. W. Dawson, now director of the geological survey of Canada, and to Mr. W. Ogilvie, the well-known surveyor and explorer. Dr. Dawson devoted the whole of that season and Mr. Ogilvie a period covering two years to obtaining geological, topographical, and general information chiefly respecting the country lying adjacent to the one hundred and forty-first meridian, the boundary between Alaska and the Northwest Territories, where the explorers found that in proximity to that boundary, on the Canadian side, there existed extensive and valuable placer gold mines in which, at the time of their visit, as many as 300 miners were at work.

Dr. Dawson's exhaustive report of the expeditious work, published in the proceedings of the geological survey of the Dominion, in 1888, furnishes the most authentic information on the district at present available.

Dr. Dawson writes:

Mining can scarcely be said to have begun in the region more than five years ago, and the extent of country over which gold has been found in greater or less quantity is already very great. Most of the prospecting has been confined to the banks and bars of the larger rivers, and it is only when their innumerable tributary streams begin to be closely searched that "gulch diggings," like those of Dease, McDame, and other streams in the Cassiar district, and possibly even on a par with Williams and Lightning creeks, in Cariboo, will be found and worked. The general result so far has been to prove that six large and long rivers—the Lewes, Tes-lin-too, Big Salmon, Pelly, Stewart, and White—yield "fine gold" along hundreds of miles of their lower courses. With the exception of the Lewes no part of the head waters of any of these have yet been prospected, or even reached, by the miners, and scarcely any of their innumerable tributaries have been examined. The developments made up to this time are sufficient to show that when means of access are improved important bar mining will take place along all these main rivers, and there is every reason to anticipate that the result of the examination in detail of the smaller streams will be the discovery of much richer auriferous alluviums. When these have been found

[1] Extract from The Mining World and Engineering Record, December 4, 1897.

and worked quartz mining will doubtless follow, and the prospects for the utilization of this great mining field in the near future appear to me to be very promising.

Dr. Dawson's favorable estimate of the gold-bearing properties of the Yukon district in 1888 has been more than borne out by subsequent events. Notwithstanding the remoteness of the region and its severe climate, the disadvantages arising from the short mining season and the enormous difficulties of forwarding supplies to the miners, the number of persons engaged in mining in the locality mentioned has steadily increased year by year, until at the commencement of the season of 1896 not less than 1,000 men were so occupied. The Canadian Government have been keeping a watchful eye on the development of mining in the Yukon region, and in 1894 and 1895 Inspector Constantine, of the northwest mounted police, was dispatched to the country with a force of men for the maintenance of order, the enforcement of law, and the administration of justice

CHILE.

No information as to the gold and silver output of Chile in 1896 having been received by this Bureau, it is assumed to have been the same as in 1895, viz, 2,118 kilograms fine of gold, of the value of $1,407,623, and 156,542 kilograms of silver, of the United States coining value of $6,505,886.

CHINA.

In the report on the production of gold and silver in the United States in 1895, page 280, the Bureau estimated the gold yield of China in that year to be 5,298.244 kilograms fine, of the value of $3,521,213.

M. de Foville, the eminent French economist and director of the French mint, expresses the opinion in an article written by him for the Annales de Geographie of May 15, 1897, that this estimate is too low. He says:

> Besides Russia, China also possesses gold, especially in Manchuria, and it may some day play a large part in international statistics. The Bureau of the Mint at Washington gives necessarily too low a figure of the production of gold in China when it credits the Celestial Empire with an annual production equal only to the exports of that metal from China to England and India. Thus, for 1895 it credits China with about 5,300 kilograms of gold, or 18,000,000 francs. The Engineering and Mining Journal estimates it at 31,000,000 francs, and this amount may not be too large.

The difference between the estimate of the Engineering and Mining Journal and that of the Bureau of the Mint of the gold output of China in 1895 is accounted for by the supposition that probably the estimate of the Engineering and Mining Journal includes in the production of China not only the exports of gold bullion from China to India and England, but also the exports of gold coin, which latter can not possibly be Chinese production. The amount of gold coin, British and other, shipped from China to England in 1895 was 143,822 ounces, British standard, i. e., 916⅔ fine, or 131,837 fine ounces, which, estimated at $20.67 per ounce, gives a total value of gold coin exported from the Celestial Empire to Great Britain in 1895 of $2,725,067. If we add this

last amount to the estimate of Chinese production in 1895 made by the Bureau, viz, $3,521,213, we obtain $6,246,280, or about 31,000,000 francs, the figures given by M. de Foville as the estimate of the Engineering and Mining Journal of Chinese production in 1895. This last, however, is evidently too large an estimate, as the gold coin exported from China consisted of British sovereigns to the amount of 12,280 ounces and gold coin not British to the amount of 131,542 ounces, which was certainly not Chinese production.

CHINA.

The Bureau of the Mint estimates the annual production of gold in China to be equal to the sum of the exports of that metal from the Empire in the form of bullion to Great Britain and India. The exports of gold bullion from China and Hongkong to Great Britain in 1896 amounted to 96,733 ounces, 0.916⅔ fine, equal to 2,758.067 kilograms, fine.

The export of gold bullion from China to India in 1896 was 1,954.928 kilograms, 0.916⅔ fine, equal to 1,792.017 kilograms, fine.

The total export of gold bullion from China to Great Britain and India in 1896 was, therefore, 4,550.084 kilograms, fine, of the value of $3,023,985, at which figure the gold output of China in 1896 appears in the table of the world's production of gold and silver in this report.

COLOMBIA.

The gold product of Colombia is estimated by this Bureau to have been 145,125 ounces, or 4,514 kilograms, fine, of the value of $3,000,000, and the silver output the same as in 1893, viz, 52,511 kilograms, fine, of the value of $2,182,400.

ECUADOR.

Our minister to Ecuador writes:

> The gold product could be safely placed at 200 kilograms, instead of 103, as in your last report.

It is accordingly estimated at that figure in 1895 and 1896.

FRANCE.

France produces no gold. The French mines in 1895 produced 17,619 kilograms, fine, of silver, of the value of $732,246, representing 566,346 ounces, fine, at which figure it appears in the table of the world's production for the year 1895. It is assumed to have been the same in 1896.

GERMANY.

The answers to the interrogatories respecting the production of gold and silver in Germany in 1896, and the output of the precious metal from its refineries during the same year, were as follows:

AMOUNT OF GOLD AND SILVER OBTAINED FROM THE SMELTING HOUSES OF THE GERMAN EMPIRE DURING 1896.

Items.	Amount.	Value at smelting house.
	Kilograms.	*Marks.*
Pure gold obtained during 1896	2,486.63	6,915,752
Of this there were obtained from—		
Domestic ores	85.40	
Foreign ores	772.26	
Domestic and foreign residues and scrapings	1,628.97	
Pure silver obtained during 1896	428,428.64	38,872,000
Of this there were obtained from—		
Domestic ores	183,252.08	
Foreign ores	200,053.09	
Domestic and foreign residues and scrapings	45,123.47	

The above statement needs some explanation. And, first, as to the gold. The total amount of gold obtained from the refineries, namely, 2,486.63 kilograms, consisted, first, of the gold obtained from domestic German ores to the amount of 85.40 kilograms. This amount was certainly obtained from German mines, and must, therefore, be considered German production. The second item of the total amount refined—that is, 772.26 kilograms—came from foreign gold ores proper imported into Germany and there smelted and refined. This item has been credited to the country or countries that produced it, and to credit it to Germany would be a duplication. It is, therefore, eliminated from the total German gold production of 1896. The third item, 1,628.97 kilograms of gold, was extracted from domestic and foreign auriferous silver and auriferous silver ores. To the extent that this last amount was obtained from domestic auriferous silver or auriferous silver ores it is German production, and must be credited to Germany; to the extent that it was obtained from foreign auriferous silver or auriferous silver ores it is also credited to Germany, not because it was obtained from German mines, but because, since it has not been possible to credit it to the foreign countries that produced it, and since it constitutes part of the total gold production of the year, it must, necessarily, be taken into account in estimating the world's gold product in 1896. It is, therefore, credited to Germany as a mere matter of convenience of tabulation, but it must be distinctly borne in mind that it is not gold obtained from German mines, whose total gold yield is insignificant.

Bearing in mind the explanation just given, the gold product credited to Germany in 1896 should equal the difference between the total amount refined, viz, 2,486.63 kilograms, and the amount obtained from foreign gold ores proper, or 772.26 kilograms—that is, 1,714 kilograms, fine, of the value of $1,139,124.40.

It is to be regretted that the information relative to the gold output

of the German refineries in 1895 was not as detailed as that for 1896. The information referred to does not give the amount of gold obtained in 1895 in the refineries from foreign gold ores; and recourse was, therefore, had to an estimate. That amount was assumed to have been in 1895 one-fourth of the total amount refined. If an estimate were made for 1896 on the same basis as for 1895, the amount of fine gold credited to Germany (not, it must be remembered, produced from German mines) would be 1,865 kilograms, or only 151 kilograms, fine, of the value of $100,354.60—more than it has actually been calculated at above.

In the absence of complete data, the estimate made of the amount of gold credited to Germany in 1895 must stand. But as the actual amount of gold to be credited to that country each year really amounts to the difference between the total amount refined and the total amount obtained in the refineries from foreign gold ores proper, the figures for 1893 and 1894 would stand as they did in reports for those years, respectively, viz:

Year.	Quantity.	Value.
	Kilograms.	
1893	2,255.30	$1,498,872
1894	3,221.46	2,140,982

and not as altered in the reports for 1895.

The estimation of the gold product of Germany has always been a matter of difficulty; and hence, in justification of the method here followed in estimating the gold yield credited to Germany, whose own mines yield very little gold, it seems necessary to repeat in extenso, what was said on the subject, in the Report on the Production of Gold and Silver for 1895. It is as follows:

Regarding the production of pure gold in Germany in the years 1892 and 1893, the United States embassy at Berlin obtained the following information from the Imperial Government:

"*Pure gold.*—In the year 1892, 3,859.2 kilograms (of the value of 10,735,775 marks), of which 718 kilograms were obtained from ores exported from countries outside the Zollverein.

"In the year 1893, 3,073.53 kilograms (of the value of 8,553,817 marks), of which 818 kilograms were obtained from ores imported from countries outside the Zollverein."

As the Zollverein embraces all the gold-mining districts of the country, the gold production of Germany in the two years 1892 and 1893, as published in the reports of this series for those years, was obtained by deducting the amounts extracted from foreign ores from the total amounts smelted in Germany, which gave for 1892 a gold product of 3,141.2 kilograms, of the value of $2,087,642, and for 1893 a gold product of 2,255.3 kilograms, of the value of $1,498,872.

Respecting the production of pure gold in Germany in 1894, the Imperial foreign office of the Empire communicated the following information to this Bureau through the Hon. John B. Jackson, chargé d'affaires of our embassy at Berlin:

"Of the 4,133.46 kilograms of pure gold smelted in the German Empire in the year 1894, 912 kilograms were obtained from foreign ores."

It seems to be a clear inference from this that 3,221.46 kilograms of pure gold were extracted in 1894 from ores mined in the German Empire.

This figure did not appear in the table of the world's production of gold and silver in the report of this Bureau on the Production of Gold and Silver for the year 1894, as it had not been received when that report was sent to press. It was published, however, in the table in the Report of the Director of the Mint, 1895.

The data sent the Bureau by the German Government through our embassy at Berlin, relative to the production of gold in 1895, are as follows:

"The amount of the production of gold from domestic mines during the year 1895 can only be estimated. * * * The total production of gold from domestic ores during the three years mentioned (1893, 1894, and 1895) can hardly have amounted to 100 kilograms a year.

Thus, while from the earlier information received from Germany it was plainly deducible that the gold product of that country in 1893 and 1894 was 2,255 kilograms and 3,221 kilograms, respectively, the later information obtained is that it can "hardly have amounted to 100 kilograms" in either of these years.

Professor Lexis, in a recent article in Conrad's Jahrbücher, offers a probable explanation of the earlier statistics for 1893 and 1894 sent out by the German Government and accepted by the Bureau. He writes:

"Germany produces an entirely insignificant quantity of gold from its own ores (auriferous silver ores). In the official statistics of the products of German smelters large quantities of gold are mentioned, but this gold is obtained almost exclusively from foreign material, and it is an error to assume the greater part of these quantities of gold to be of German origin, as is done in the Report of the Director of the Mint of the United States. The Director, indeed, relies on official information, according to which, in 1893, for instance, out of 3,073.5 kilograms of gold, 818 were obtained from imported ores, so that 2,255.5 kilograms remained as of German origin. The error may probably be accounted for by the fact that these 818 kilograms represent the quantity of gold obtained from foreign gold ores proper; but besides this amount there is the much larger quantity separated from foreign auriferous silver ores and auriferous silver, so that the amount of gold remaining to be credited to the account of Germany really amounts to only a few kilograms.

"If we adopt the method followed by the Director of the Mint of the United States, according to which the precious metal is credited to the country that produces the ore, it would be best to omit Germany entirely from the list of gold-producing countries."

What Professor Lexis says, in the above extract, of the 818 kilograms obtained from imported ores is doubtless correct. That was the amount obtained in German refineries in 1893 from "foreign gold ores, proper," imported into Germany, which were credited to the countries that produced them. What Professor Lexis says of these 818 kilograms obtained from foreign ores in 1893, may be repeated of the 772.26 kilograms of fine gold extracted in Germany from foreign gold ore, proper, in 1896.

Dr. Soetbeer, several years ago, recommended this same course, and his advice was actually followed in the report on the production of gold and silver in 1891, page 72, where the Director of the Mint (Mr. E. O. Leech) says:

Although Germany smelted 3,077 kilograms of gold in 1891, it produced scarcely any from its own mines, and is, therefore, credited with none in our table of the world's production of gold and silver.

It must be noted, however, that by dropping Germany entirely from the list of gold-producing countries a part of the world's total gold output is left unrecorded; for, as Professor Lexis says in another part of the article referred to—

In the figures showing the world's production of gold and silver for the years 1885 to 1894, both inclusive, given in the reports of the Director of the Mint of the United States, Germany is credited with a gold product of 1,000 to 3,000 kilograms, although the real gold production from its own ores is insignificant. *As, however, the greater part of this gold has been separated from silver whose gold contents do not figure in the statistics of any other country, it is not improper to embrace it as an item in the world's production of gold.*

The gold output of the German smelters from 1892 to 1895 was officially reported as follows:

	Kilograms.		Kilograms.
1892	3,859.2	1894	4,133.46
1893	3,073.53	1895	4,460.81

Now, as Professor Lexis says, the greater part of this gold has been parted from silver whose gold contents do not figure in the statistics of any other country. It may be safely assumed that at least three-fourths of it have been so parted, and in order that it may figure in the world's output of gold, Germany is credited in the table of the world's production with three-fourths of the annual output of its smelters, and a note is added stating that the amounts so credited to that country are "gold separated in Germany from silver whose gold contents do not figure in the statistics of any other country." Opposite Germany, in the table of the world's production, in the column headed "Gold," in the present report, therefore, appear the figures—

	Kilograms.
1893	2,305
1894	3,100
1895	3,345

The earlier figures for 1892, 1893, and 1894, published in this series of reports, have been returned to in the present report, for reasons stated at the beginning of this article on German production for 1896.

Germany's silver output in 1896 from its own mines was 183,252 kilograms, fine, of the value of $7,615,953, at which figure it appears in the table of the world's production of gold and silver in 1896.

THE ELECTROLYTIC REFINING OF GOLD AT THE NORTH GERMAN REFINERY AT HAMBURG.

By Titus Ulke, E. M.

The following method of separating gold from platinum and other metals by electro-deposition is practiced at the Norddeutsche Affinerie of Hamburg, Germany.

The gold bars to be refined are cast into anodes and suspended opposite fine sheet gold cathodes in a dilute solution of gold chloride and the plates connected in multiple series. Upon passing the current absolutely fine gold is deposited on the cathodes, and when the latter have reached the desirable weight they are taken out, washed, dried, melted, and cast into fine gold bars. By this electrolytic method high current densities are used so as to secure the gold in marketable shape in the shortest possible time.

In eletcrolysing a neutral solution of pure chloride of gold, between gold electrodes, chlorine will escape at the anode, even when very low current densities, say less than 10 amperes per square meter are employed. This loss of chlorine can not be prevented by simply increasing the temperature of the solution. The same phenomenon occurs with weak acid solutions, such, for example, as are obtained by evaporating an aqua regia solution of gold, when one uses higher current densities, yet lying far under 100 amperes per square meter. Investigation has shown that this undesirable escape of chlorine, which increases with the current density, can be reduced and even be prevented altogether within certain limits, by adding an excess of hydrochloric acid, and by heating the electrolyte. In this way it is possible to utilize the chlorine for dissolving gold at the anode even in comparatively weak solutions of gold chloride, and with current densities as high as 1,000 amperes and above per square meter. The Hamburg process therefore consists in electro-refining impure gold bullion in a heated solution of gold chloride in the presence of an excess of hydrochloric acid.

The best results are obtained by keeping the electrolyte at a temperature between 60° and 70° C., the gold contents at 25 to 30 grams gold per liter, the quantity of acid between 20 and 50 c. cm. of strong hydrochloric acid of 1.19 specific gravity per liter of solution, according to the current density. Any appreciable fall in the temperature or in the amount of acid present is immediately shown by the evolution of chlorine gas. At the proper temperature, acidity, and current strength, the gold, platinum, palladium, and nearly all of the impurities of the

anodes are dissolved. The undissolved residue consists of the larger part of the iridium present, and other undissolved platinum metals, some silver chloride coming from whatever silver there is in the bullion, a portion of the lead, as lead chloride, when the electrolyte is saturated with lead salts, and bismuth as oxychloride when there is not sufficient acid to dissolve it. In the residue is always found, besides some little anode scrap, a quantity of very finely divided gold, amounting to about 10 per cent of the weight of the anode. The presence of this gold is explained on the assumption that some aurous chloride is formed at the anode, which immediately decomposes into auric chloride and gold.

While in this way the components of the anode partly go into solution and partly collect in the slimes, which gather on the bottom of the vat, the gold deposited, even with a current density exceeding 500 amperes per square meter, is absolutely pure.

The metal that is deposited on the cathode is replaced in the solution chiefly by the gold dissolved at the anode, partly by equivalent quantities of other soluble metals, and also by the precipitated chlorides of silver, lead, and bismuth. The percentage of gold in solution, therefore, steadily decreases as the electro-deposition proceeds, unless gold chloride is from time to time added. The corresponding increase in the percentage of impurities in the solution under these circumstances has no injurious influence on the purity of the deposited gold; on the contrary, the presence of a certain amount of impurities is actually necessary to secure a dense electro-deposit, otherwise unobtainable when high current densities are employed.

It appears that the above method, as carried out at Hamburg, is a continuous process and reduces the consumption of acid to a minimum. Whereas the usual wet method of refining gold requires fresh hydrochloric and nitric acid, as well as precipitant, for every new portion of the material to be dissolved, the new electrolytic method permits the repeated use of the acid once added, so that this same small quantity of hydrochloric acid is used in dissolving and precipitating very many portions of the gold. Another advantage of the above method lies in the possibility of concentrating the small quantities of platinum in the anode, so that after taking out all the gold from the solution, the platinum may be obtained as ammonium platinum chloride. For example, if 20 kilograms of gold bullion, containing an average of one-tenth of 1 per cent platinum, are refined daily, in a hundred days nearly 2 kilograms of platinum will have accumulated in the solution. Now, as it has been demonstrated that the purity of the deposited gold is not injuriously affected, as long as the quantity of platinum in the solution does not exceed twice the amount of gold present, the electrolytic process may be continued up to this point, or to a time when the working up of the platinum appears advantageous. When the weight of the palladium in solution exceeds 5 grams per liter, this metal begins to

deposit with the gold in traces; but as the amount of palladium rarely exceeds small fractions of the amount of platinum present, the above consideration need alone govern the renewal of the electrolyte.

In conducting the process at the Norddeutsche Affinerie the highest practical current densities are used to secure the most rapid output possible, and the bullion anodes are cast very thin (4 mm. thick), owing to the high value of the contained metal. With a current density of at least 400 amperes per square meter of anode surface the anodes are consumed to within one-tenth of their original weight in twenty-four hours. The scraps are then remelted for further treatment, together with a like amount of the finely divided gold that has accumulated on the bottom of the vat. Rolled sheets of fine gold are used as cathodes. They are made narrower than the anodes, on account of their gradual enlargement as the deposition proceeds. As the gold is not deposited loosely, even with high-current densities, the electrodes may be placed as close as 3 cm. apart without causing short-circuiting or deterioration of the deposit. This distance between the electrodes must naturally be increased with pure solutions or the cathodes must be changed more frequently, as the gold thrown down from such solutions is not very dense.

The process is carried out in vessels of stoneware, porcelain, or of other material capable of withstanding the action of hot dilute muriatic acid. Automatic devices retain the height of the electrolyte in the vessel at a uniform level. When this level begins to fall, owing to evaporation of the hot electrolyte and to other causes, the solution is automatically fed from supply bottles filled with wash water containing small quantities of gold chloride, obtained in washing the precipitates and residues.

In treating gold alloys to secure pure gold, gold chloride must be added to the solution the more frequently the larger the percentage of metal other than gold in the alloy and the lower their electro-chemical equivalent weight. If the alloy to be parted is largely composed of silver a compact, adherent, nonconducting layer of silver chloride soon covers the anode, and by reducing the effective anode area causes the evolution of chlorine gas. Consequently the anode does not dissolve as fast as usual and the percentage of gold is rapidly reduced if the layer of silver chloride forming on the anode is not periodically removed by mechanical means, such as brushes or scrapers. In a similar way interruptions of the process due to the collection of oxychloride of bismuth may be prevented. If the alloy contains lead besides silver and other metals the muriatic-acid solution becomes saturated with chloride of lead, which spreads over and soon covers both electrodes, electrolyte, and the depositing vessel. An uninterrupted process, however, is even here possible if sulphuric acid is added to the solution from time to time and if the lead sulphate which forms on the anode is removed mechanically. In conclusion, attention may be

called to the fact that the new method has many advantages, as above noted, over the old method of refining gold by acids and fluxes, and offers a cheap way, wherever current is available, of securing proof gold.

GREAT BRITAIN.

Respecting the production of gold and silver in Great Britain in 1896 the Bureau has received the following information:

FOREIGN OFFICE, *August 20, 1897.*

YOUR EXCELLENCY: In continuation of my note of the 21st of April, conveying certain information desired by the United States Government respecting the coinage and production of gold and silver in this country, I have the honor to inform your excellency that I have now received from the department of Her Majesty's Government concerned a statement to the effect that the weight and value of the gold and silver produced from the mines of this country in the calendar year 1896 amounted to 42 kilograms of gold, value £5,045, and 8,828 kilograms of silver, value £36,365.

The value of the silver has been calculated at 30¾d. per ounce, being the average price of standard silver for 1896 in the London market.

I have the honor to be, etc.,

SALISBURY.

His excellency the Hon. JOHN HAY, etc.

Five thousand and forty-five pounds sterling equals $24,551, representing 36.941, or very nearly 37, kilograms fine, at which the gold product of Great Britain appears in the table of the world's production in 1896.

The silver yield of Great Britain in 1896 was, as stated above, valued at £36,365, or $176,970, commercial value, which, at the average price of fine silver in 1896, viz, $0.674 per ounce, represents 262,567 ounces, or 8,168.42 kilograms fine, of the coining value of $339,480.

GREECE.

The information received by this Bureau on the production of the precious metals in Greece in 1896 was as follows:

Gold produced, none. Silver produced, none directly. The output of lead ore from the Laurium mines was about 16,000 tons, said to contain about 2,000 grams of pure silver per ton. This argentiferous lead is exported to various parts of Europe. The silver is not extracted in Greece.

Sixteen thousand tons of ore, containing 2,000 grams, or 2 kilograms, to the ton, would make the total silver yield of Greece, in 1896, 32,000 kilograms fine, of the coining value of $1,329,920, at which figure it is placed in the table of the world's production in this report.

THE GUIANAS.

BRITISH GUIANAS.

No returns have been obtained by this Bureau of the gold product of British Guiana either in the calendar year 1896 or in the fiscal year ended March 31, 1897. It is, therefore, assumed to have been the same as in the calendar year 1895, viz, 122,936 ounces crude, of the value, at $18 per ounce, of $2,213,000. It was probably somewhat larger than the figures here given.

GOLD MINING IN BRITISH GUIANA.[1]

The mining industry of British Guiana is thus reported upon in the blue book of the colony for the year 1895–96:

The following table, showing the rise in the gold industry during the last ten years, is interesting:

	Ounces.		Ounces.
1895–96	121,285	1890–91	66,851
1894–95	132,995	1889–90	32,332
1893–94	138,527	1888–89	20,216
1892–93	134,124	1887–88	10,986
1891–92	110,555		

It would be a mistake to regard the falling off in the last two years as indicative of the general condition of the industry. In 1893–94 practically the whole of the available capital in the colony was devoted to placer mining, but since then a large proportion has been withdrawn for the development of quartz reefs and the flotation of companies to work them, which so far have not yielded any return. An unremunerative interval of two years in the case of mines assaying richly and full of promise may seem long to those unfamiliar with the natural difficulties to be overcome. The dense forests, broad creeks, and strong currents, which must be cleared, crossed, and stemmed before one ton of machinery can be taken to the spot where its work is to be done, have offered obstacles perhaps as great as miner ever knew. But they have been surmounted, and at the time of writing (November, 1896) one mill of 20 stamps has been crushing for some weeks in the heart of the Northwest district, while two others are in course of erection. From the former there has been a steady yield of about an ounce per ton. These pioneer works, carried on in a virgin forest, with but a scanty supply of technical and scientific aid, have been costly, and the financial resources of the people have been severely strained. In these circumstances it is a matter for congratulation that the placer yield has maintained its position so well as to be only some 9 per cent less than in the previous year. In the meantime, it has been demonstrated by local enterprise that rich quartz exists in large quantities within reach of the pickax and the mill, and with the influx of English capital which must follow a wider knowledge of the possibilities of the country a prosperous future may well be predicted.

[Économiste Européen, 266 bis, p. 56.]

The exportation of gold during the first two weeks of 1897 amounted to 2,234 ounces, of the value of $42,320, as compared with 1,928 ounces, of the value of $34,206, in the corresponding period of 1896.

In 1893–94 nearly all the capital that could be disposed of in the colony was invested in the working of the placers, but since then a considerable proportion of it has been employed in the development of the quartz. The results already attained may be considered remarkable when the difficulties attendant on the opening up of the deep mines in a country covered with dense forests, and in the bad season with torrents, are borne in mind. The obstacles have been overcome in a relatively short time, and at the beginning of 1897 a mill of 20 stamps was in operation in the northwestern part of the country, and two others were in course of construction in other parts. At least an ounce per ton has been extracted from the first.

It has been demonstrated that gold exists in several localities in rather rich deposits.

[From Consular Report for April, 1897.]

The gold industry of British Guiana[2] started about twelve years ago, and steadily advanced to and including the year 1893, when the exports amounted to something

[1] Extract from The Economist, February 6, 1897, p. 201.

[2] Consul Patterson states that the gold mines of British Guiana (so called) mentioned by him are situated in the territory in dispute between British Guiana and Venezuela.

over $2,300,000. The output for 1894 was not equal to that of 1893 by about 13,000 ounces, but was about equal to that of 1892. The year 1895 again showed a falling off, as does 1896 up to the present time. This decrease, it is claimed, is caused by a great many investors having withdrawn from the placer washings and joined the mining companies, only one of which has commenced crushing. But I think the true cause is that the majority of the placers that pay have been worked out. There is no doubt if there were some easy and cheap communication with the interior a large number of placers could be made to pay handsomely. The expense of getting to and from these placers is so heavy that their working is unprofitable.

I learn from reliable American miners that there are very few creeks in the colony but what show "color," and many of them can not be worked on account of the expense of getting to and from them and the heavy royalty the Government exacts, viz, 90 cents per ounce.

In the face of all the drawbacks incident to mining in this colony, there are about 7,000 men employed by the numerous syndicates.

The most successful placer that has ever been worked by any syndicate in this colony, producing something over 18,000 ounces in three years, viz, the Barnard Syndicate, was discovered and managed by an American. This placer is twenty-one days from Georgetown, up the Mazaruni River, but the return to Georgetown can be made in less than a week. This will give some idea of the expense and time required to reach some of the placers, and it can be readily seen that a placer has to pay handsomely to justify its working.

The expense of prospecting is very great—five to ten times the cost in the United States. One person can not prospect alone, as provisions have to be carried for the entire journey. There are no roads in the interior, but a virgin, tropical forest to contend with, where the traveler can not see 20 feet, and paths have to be cut as the prospectors go along. The expense of a small prospecting trip for four months, with four laborers, will be from $500 to $800.

What the outcome of quartz mining in this colony is to be seems uncertain. Experts as well as miners are in doubt, while many others are very confident. There is no question as to the richness of the quartz, but there has not been as yet enough of development work to prove that it is in quantities sufficient to justify the expenditure of large sums of money. I have seen samples of quartz from the Barima Gold Mining Company with pieces of gold as large as wheat grains sticking all through them, and have in my possession a piece of quartz weighing about 10 pounds thus studded with gold. How much of this class of quartz they have I am unable to say, but from the quantity of ore crushed and of gold yielded, as per report below, I am of the opinion there is not a very large vein of this rich ore, although the company claims that the poorest ore is being crushed first. The manager of this mine and nearly all the staff are Americans.

Gold-bearing quartz has been found in other sections, and the impression prevails that some of it is fully as rich as the Barima.

* * * * * * *

We are looking for a large development in the gold industry in spite of the unsettled state of the Venezuelan boundary question.

DUTCH GUIANA.

The export of gold from Dutch Guiana in 1896 amounted to 874.897 kilograms, of the value of 1,370 gulden per kilogram. The total value of the exports was, therefore, 1,198,608 gulden, or $481,841, representing 725 kilograms fine, at which figure the gold product of Dutch Guiana appears in the table of the world's production of gold and silver in the present report.

The export of gold from Dutch Guiana in 1895 was 954.294 kilograms, of the value of 1,307,383 gulden, or $525,568, representing 791 kilograms fine. This figure differs somewhat from that given in the report for 1895, and is in the table of the world's production substituted for it.

The production and export of gold from Dutch Guiana in the years 1886 to 1895 were as follows:

Year.	Production.		Export.	
	Weight.	Value.	Weight.	Value.
	Kilograms.	*Florins.*	*Kilograms.*	*Florins.*
1886	711.515	974,775	753.845	1,032,767
1887	858.859	1,176,636	1,006.904	1,379,458
1888	588.624	806,415	1,029.777	1,410,794
1889	645.019	883,676	894.333	1,125,236
1890	814.352	1,115,662	952.023	1,304,271
1891	1,236.919	1,704,579	820.983	1,124,746
1892	810.713	1,088,980	1,078.966	1,478,163
1893	867.644	1,188,672	1,159.675	1,588,755
1894	776.634	1,063,989	1,181.601	1,618,793
1895	748.539	1,025,498	954.294	1,307,383
1896	.....	.....	874.897	1,198.608

It will be noticed that the export of gold from Dutch Guiana is taken as its production instead of what is designated in the above table as "production." The reason for this was explained in the report of this series for 1891, pages 116 and 117.

The Handels-Archiv uniformly calls production what is denominated "exportation" in the above table. * * *

A glance at it shows that the declared exports of gold from Dutch Guiana has since 1886, with the exception of one year, been greatly in excess of the production, which is accounted for by the fact that the "production" figures are, as the official statistical compilation of the Dutch colonies, notes obtained from interested parties. We, therefore, take the "exportation" as more nearly representing the production.

The production of gold in Dutch Guiana in 1896 did not come up to expectations, although, since 1895, some gold placers have been worked in that country by the hydraulic process. The partial cessation of the gold washings is ascribed to the lack of water.

Thus far only gold washings have been carried on in Dutch Guiana, latterly, with the aid of hydraulic machines, instead of which it is intended to introduce on one of the placers a new system called the "shifting plant." This differs from the old system in the movability at will of the machines, which, under the old method, were stationary.

Notwithstanding the passage of strict laws relating to the discovery, possession, and sale of gold, the taxes and export duties on that metal yielded in 1896 an amount of only 61,488 gulden, against 74,178 gulden in 1895 and 68,690 gulden in 1893.

FRENCH GUIANA.

When the last report of this series was published, no returns had been received of the gold output of French Guiana in 1895, and it was assumed to have been the same as in 1894. Since then the Statistique de l'Industrie Minerale, Paris, 1896, has published the following:

The quantity of gold declared at the custom-houses of French Guiana in 1895 was 2,807.5 kilograms. Of this quantity, 886.2 kilograms came from French Guiana itself, and 1,921.3 kilograms from the territory in dispute between French Guiana and Brazil. Of the auriferous beds of Guiana, those of Mana, Sinnamary, and Approneque produced, respectively, 311, 342, and 140 kilograms of gold.

The entire quantity of gold declared at the custom-houses of British Guiana in 1895 is taken as the production of the colony in that year. The amount reported, 2,807.5 kilograms, is fine gold, of the value of $1,865,864.50; and the production of French Guiana in 1895 is placed at that figure in the table of the world's production in 1895. The gold yield of the colony is assumed to have been the same in 1896 as in 1895, no returns having been received for the former year.

ITALY.

In the last report on the production of gold and silver, issued from the Bureau of the Mint, the gold and silver output of the Italian mines in 1895 was assumed to have been the same as in 1894, no returns having been received for the former year. Since then this Bureau has been officially informed that the gold product of Italy in 1895 was valued at 649,434 lire, or $125,341, representing 188.595 kilograms fine. The gold product of Italy in 1896 is assumed to have been the same as in 1895.

The silver yield of the mines of Italy in 1895 was of the value of 641,366 lire, or $123,784, which, at the commercial price of silver in that year, viz, $0.674 per ounce, represents 5,713.5 kilograms fine. The silver product of Italy in 1896 is placed at the same figure as in 1895.

JAPAN.

The production of gold and silver in Japan in 1896 is calculated, as in previous years, by adding the product of the imperial household mines in 1896 to that of the private mines two years previous.

GOLD AND SILVER PRODUCT OF JAPAN IN 1896.

Mines.	Gold.		Silver.	
	Weight.	Value.	Weight.	Value.
	Kilograms.	*Yen.*	*Kilograms.*	*Yen.*
Government, 1896	287.6325	229,297.644	5,973.4365	230,574.081
Private, 1894	785.6587	751,181.092	72,035.7253	2,854,521.798
Total	1,073.2912	980,478.736	78,009.1618	3,085,095.879

The values of silver given in the above tables are commercial values. The coining value of the 78,009 kilograms of silver produced in Japan in 1896 was $3,242,054, and that of the gold $713,309. These are the figures at which the gold and silver product of Japan in 1896 appears in the table of the world's production in the present report.

The official returns from Japan in 1896 were as follows:

AMOUNT OF GOLD BULLION PRODUCED FROM THE IMPERIAL HOUSEHOLD MINES FROM JANUARY TO OCTOBER, 1896.

Weight	kilograms..	287.6325
Value	yen..	229,297.644

AMOUNT OF GOLD PRODUCED FROM PRIVATE MINES DURING THE YEAR 1894.

Weight	kilograms..	785.6587
Value	yen..	751,181.092

NOTE.—The imperial household mines were sold in October last to private parties, and since that time the amount of production is unknown. The amount of production from private mines for 1895 and 1896 is now under investigation. The amount for 1894 only is given, as is also the case with the production of silver. The values are commercial values.

AMOUNT OF SILVER PRODUCED FROM THE IMPERIAL HOUSEHOLD MINES FROM JANUARY TO OCTOBER, 1896.

Weight	kilograms..	5,973.4365
Value	yen..	230,574.081

AMOUNT OF SILVER PRODUCED FROM PRIVATE MINES DURING THE YEAR 1894.

Weight	kilograms..	72,035.7253
Value	yen..	2,854,521.798

KOREA.

The production of gold in Korea in 1896 may be estimated as equal to the exports of that metal from the country, viz, 1,443,530 silver yen. The average price of a silver yen in that year was $0.50 in United States gold, making the total gold exports $721,765, representing 1,086.013 kilograms.

The United States consul at Seoul informed this Bureau in 1896 that the real exports of gold, and, consequently, the actual gold production of Korea, is probably double the amount declared. Large quantities of the metal are smuggled over the border or carried away in passengers' luggage.

[Extracts from No. 1957, Diplomatic and Consular Reports on Trade and Finance of Korea.]

Gold, the article of native produce which helps Korea to redress her balance of trade, was exported in a larger quantity than in the previous year, the declared export from Wonsan alone having reached over $1,000,000. It is doubtful whether this increase is due to enlarged production or diminished clandestine shipments, but the commissioner of customs seems to favor the former inference. The excess of Korean imports over exports, gold included, is only about £50,000; but, as is well known, the export of gold which is declared is merely a fraction of what leaves the

country, and it may therefore be accepted as certain that Korea is able to pay for a larger supply of foreign goods than she has taken in the past year. The wild dreams of finding an El Dorado of mineral wealth in Korea, which were indulged in before the country was opened to foreign intercourse, have long passed away, but considering the results obtained by surface washing, as evidenced by the yearly export of gold dust, it is strange that the development of Korea's mineral resources has attracted so little attention on the part of foreign capitalists, more especially as the Government is not so illiberal as most Asiatic Governments in granting facilities for the purpose.

MADAGASCAR.

Relative to the gold product of Madagascar, this Bureau received the following letter from Mr. de Foville, director of the French mint:

PARIS, *April 3, 1897.*

You have asked me in your letter, dated March 12 last, at what figure the annual production of gold in Madagascar might be estimated.

I have the honor to inform you that there are as yet, no accurate statistics of the production of the gold mines of our new colony. Recent events have prevented the working of the mineral wealth of that country. There has, however, been a renewal of activity in some centers of production there for several months past.

I may add that the production of gold in Madagascar has been estimated at from 2,000,000 to 3,000,000 francs per annum, but this estimate does not emanate from an official source.

Accept Mr. Director and dear Colleague, the expression of my distinguished and devoted sentiments.

A. DE FOVILLE,
Director of the Mint.

Mr. PRESTON,
Director of the Mint of the United States.

In view of the data given above it seems reasonable to assume the gold product of Madagascar during the last three years, at 2,500,000 francs or $482,500, representing 726 kilograms fine, each year, and it is placed at these figures in the table of the world's production of gold and silver in the present report, subject of course, to revision when more accurate information is obtained.

The Statistique de L'Industrie Minerale credits Madagascar with a gold product in 1892 of 261 kilograms fine, remarking that the official statistics placed it at 300 kilograms, of the average value of 3,000 francs in that year.

GOLD TRAFFIC AND GOLD MINING IN MADAGASCAR.

Our consul at Tamatave writes as follows respecting the laws of Madagascar on gold exports from that country and on cognate subjects:

I have the honor to call attention to certain recent enactments, laws, or orders concerning gold export and buying which threaten to breed, in the near future, considerable trouble between the local authorities here and the foreign merchants.

The gold traffic has always been practically an illicit one, carried on sub rosa by all foreigners in Madagascar, irrespective of nationality or of moral status, the gold being carried on board by parties shipping and entered on the purser's manifest as "specie."

A law was recently promulgated at Antananarivo by being published in the Ny Gazety Malagasy, of July 31, which, after making various provisions relative to gold

mining and mining of precious metals and stones, affects most seriously this traffic in gold. Article 27 of said law provides for an annual license fee of 1,800 francs ($347.40) for permission to carry on said traffic. It declares that miners who sell their own produce are not to be considered as engaging in said traffic, but provides further, that every trader must keep such books as the administration shall prescribe, and that such books are open to and shall be visé̂d by the Government's agents. Article 32 provides a penalty of from 100 to 1,000 francs ($19.30 to $193) and imprisonment for from one to five days for such traders as do not keep such books or who refuse to exhibit them, with forfeiture of materials seized in the latter case. Article 34 provides a penalty of 1,000 to 25,000 francs ($193 to $4,825) and imprisonment for from three months to three years for such traders as without license engage in a traffic in gold, precious metals, or stones, and a like penalty for anyone engaging in the trade of buying such metals or stones in the rough from a person not holding a working permit or a vendor's license.

EDW. TELFAIR WETTER, *Consul.*

TAMATAVE, *August 18, 1896.*

GOLD-MINING LAW OF MADAGASCAR.

The following is a translation of the law referred to in the foregoing report and transmitted by Consul Wetter under date of September 1, 1896:

MINING OF GOLD, PRECIOUS METALS, AND PRECIOUS STONES IN MADAGASCAR.

I, Ranavalomanjaka III, having succeeded to the title of my ancestors and, under the dominion of the French Republic, Queen of Madagascar and defender of the laws of my country, do promulgate the following law:

TITLE I.—GENERAL DISPOSITIONS.

ARTICLE 1. The present law is applicable to alluvions, pockets, beds, and lodes containing gold or other precious metals, such as silver and platinum and precious stones.

The mining of other mineral substances is regulated by special law.

If complex deposits containing both common and precious metals are discovered, the chief of the service of mines shall decide, after inquiry, as to which of the two laws must control their working.

ART. 2. French citizens, subjects, and protegés as well as foreigners are permitted to prospect for and to work mines; natives must be authorized by the governor of their Province, under the approval of the resident.

French and native functionaries of the administration of Madagascar in active service are prohibited from engaging in prospecting for and in working mines.

ART. 3. Mining can be carried on only within the mining districts declared opened to public working.

Prospecting can be done in territory not declared opened to public working under the conditions set forth in the following title:

TITLE II.—PROSPECTING IN TERRITORY NOT DECLARED OPENED TO PUBLIC WORKING.

ART. 4. Anyone desirous of prospecting in territory not declared opened to public working must apply for a prospecting permit either to the service of mines at Tananarivo or to a resident. This permit is granted upon payment of the sum of 25 francs ($4.83). It is valid for one year, and is renewable indefinitely under like procedure. It grants the right of prospecting beyond the declared districts and of setting up prospect signals.

ART. 5. A prospect signal is a stake 2 meters (6 feet 6¾ inches) high, to which a placard has been affixed, bearing, in the French language, the name of the discov-

erer, the place and date of his permit's issuance, the date of the setting up of the signal, and the notification that gold, the precious metals, and precious stones are the object of his quest.

A signal can not be set up at a less distance than 5 kilometers (3.10688 miles) from every already established signal; it must be located on the outside of every mining district already declared opened to public working. Signals set up by the same discoverer must be distant at least 25 kilometers (15.5344 miles) from one another.

As soon as a signal is set up, the discoverer must give notice of it in writing to the resident of the Province, who will inform the service of mines at Tananarivo thereof. The discoverer must indicate with all possible precision the place where the signal is set, failing which indication the notice can be held as void.

The notice is recorded in a special register, with notation of the date and hour of its receipt by the resident.

ART. 6. The discoverer has the sole right of digging within a circle of 2½ kilometers (1.55344 miles) radius around each of the signals which he has set up, on condition of keeping outside of the circles already occupied by the other discoverers and of the mining districts declared opened to public working.

It is forbidden to make any excavations (1) within the grounds of works of public utility; (2) in the roads and pathways and in their dependencies; (3) within a zone of 50 meters (164 feet ½ inch) around works of art; (4) within burial places and within a zone of 10 meters (32 feet 9.1 inches) around; (5) upon lands fenced in by walls and within a zone of 50 meters (164 feet ½ inch) around any houses and wells, and of 10 meters (32 feet 9.1 inches) around any inclosures, without special authorization of the owner.

On uninclosed property, if the proprietor of the soil opposes the excavation, the same can not be undertaken but under authorization of the resident of the province.

ART. 7. The discoverer is responsible for any temporary or permanent damages sustained because of any excavation by the lands or husbandry. All damages of this nature give cause for an indemnity in double the accruing injury.

The competent judge shall be the justice of the peace whenever the dispute shall not have been raised wholly between natives.

TITLE III.—ESTABLISHMENT OF MINING DISTRICTS DECLARED OPENED TO PUBLIC WORKING.

ART. 8. Every prospector who has discovered a deposit outside of a declared mining district and who desires to work same must address on that subject a declaration to the service of mines at Tananarivo.

The declaration shall be recorded in a special register, with notation of the date and hour when it was received.

The service of mines shall proceed to an inquiry, in consequence whereof it will decide if there be cause either to declare one or more mining districts opened or to attach the discovered deposits to any of the already declared mining districts.

ART. 9. If one or more new mining districts are declared, the service of mines shall decide who are the persons that ought to enjoy, in each of said districts, the rights of discoverer as defined in article 11.

The service of mines fixes the dimensions and the rentals of mining lots (claims) in each district conformable to the following provisions:

Lots (claims) are divided into three classes:

(1) The lot in rich alluvions is a square 100 meters (328 feet 1 inch) each side; (2) the lot (claim) in less rich alluvions and in diamonds in rock is a rectangle 200 by 250 meters (636 feet 2 inches by 820 feet 2½ inches); (3) the lot (claim) in poor alluvions in deep placers and in lodes is a rectangle 240 meters by 1 kilometer (787 feet 4⅛ inches by 3,280 feet 10 inches). For each of these classes the monthly rental is fixed by the service of mines.

The rentals may be revised every two years, in order to keep account of the ratio between the yield in gold, precious metals, or precious stones, which served as a basis for the previous fixing of prices, and the actually proven yield during the last six months.

ART. 10. Each mining district is placed under the control of a commissioner of mines, whose powers are defined in articles 12, 15, 16, 21, 25, and 28 of the present law. The residents can be invested, by order of the resident-general, with the functions of commissioner of mines.

ART. 11. During the week which follows the installation of the commissioner of mines the discoverers, nominated conformably to article 9, have the right to mark off for themselves, respectively, around the signals which they have set up and which they have described in their declarations, a number of contiguous lots (claims), which must not exceed eighty; the smaller dimension of the entire piece of ground must not be less than a quarter of the larger one. One of these lots (claims), which the discoverer has the right to designate, will be exempted from rental for ten years.

ART. 12. During the three weeks following the commissioner of mines will designate what sections of the mining district shall be placed under the different lot (claim) classifications. On the thirty-first day after his installation he will declare that the mining district is actually opened to public working.

ART. 13. Anyone, other than the discoverer, who desires to obtain any mining lots (claims) must apply to the commissioner of mines for a corresponding number of permits and deposit the first month's rental thereon. The number of permits that can be granted to the same person can not exceed ten.

The application will be recorded in a special register, with notation of the hour and date when it was filed.

The permit is issued, according to the order of record, within the briefest delay. It contains mention of the date and hour of its issuance. Nevertheless, the prospectors who shall have set up a prospecting signal within the mining district prior to the date of the first declaration of its opening have right of priority over other applicants.

ART. 14. Anyone provided with a certain number of permits of any of the three classes has the right to peg off an equal number of contiguous lots (claims) of that class within the regions designated therefor by the commissioner of mines. Any lot (claim) or group of lots (claims) belonging to the same person must have the boundaries established by stakes of a diameter of at least 5 centimeters (1.9685 inches) and extending above the soil at least 1 meter (39.37 inches). They can not be further than 25 meters (82 feet $\frac{1}{4}$ inch) apart for lots (claims) of the first class, nor further than 50 meters (164 feet $\frac{1}{2}$ inch) for lots (claims) of the second and third classes. The corner stakes, of a height of 2 meters (6 feet $6\frac{3}{4}$ inches), must bear a placard indicating, in the French language, the number of lots (claims), the name of the occupant, the date and hour of the issuance of the corresponding permits, and the date of the location. Every lot pegged off must be declared to the commissioner of mines and will receive a class number, which must be inscribed upon the placards of the four corner posts.

ART. 15. If a contention arises between miners on account of the pegging off of a lot (claim), the contest must be brought before the commissioner of mines, who settles it, taking into consideration the seniority of date of the titles which he has delivered and the rights of priority which result therefrom. The pieces of ground which remain unoccupied between the lots (claims), and whose dimensions are less than those of a full lot (claim), may be assigned to one of the occupants of the neighboring lots (claims), on condition that he takes out a special title for each such piece.

In case of rivalry for the assignment of these pieces of land, the commissioner of mines must proceed to sell same by auction to the holders of the contiguous lots (claims). The bids must be for a sum, to be immediately paid in, in excess of the rentals.

TITLE IV.—THE RÉGIME OF THE MINING DISTRICTS DECLARED OPEN TO PUBLIC WORKING.

Section I.—Duties and obligations of holders of mining lots (claims) toward the State.

ART. 16. If the holder of a mining lot (claim) fails to pay in advance the corresponding monthly rental, a delay of five days will be granted him. After this delay the commissioner of mines will cause its sale at auction to be announced for the twenty-fifth day following, up to which date the miner has the right to prevent the placing of his lot (claim) on sale by paying the rental due and a fine of 2 francs (39 cents) for each day of delay, failing which it escheats to the profit of the State.

In case no sale is made, the pegs are removed from the lot (claim), and the ground becomes again vacant.

ART. 17. Any miner can abandon his lot (claim) and peg off a new one on condition of making declaration thereof to the commissioner of mines. Abandoned lots (claims) are put up at auction in the before said manner.

ART. 18. Every lot (claim) is transferable. The new holder must provide himself with a corresponding permit. No transfer is valid prior to the date of its registry by the commissioner of mines.

ART. 19. On each sale a transfer duty is due of 4 per cent on the purchase price.

All titles issued by mining associations are subject to a transfer duty of 1 per cent for personal titles and an annual subscription duty of four-tenths of 1 per cent for titles to bearer.

Section II.—The registry of lots (claims).

ART. 20. The registry of the lots (claims) secures the following advantages:

(1) The registered lot is a fixture.

(2) Registered lots (claims) can be hypothecated like ordinary real estate. The registry of the mortgages must be made at the office of the commissioner of mines. The registration fee is 10 francs ($1.93) per lot (claim).

(3) By derogation of article 16, the delay, after which the commissioner of mines must issue process for the payment of the rent, is extended to six months; if, after a delay of three months, the rentals due are not settled, the lot (claim) will be sold at auction; but the State can only deduct from the amount realized by the sale the rentals due and a fine of 50 francs ($9.65), the residue being returned to the original holder.

ART. 21. Any miner can have his lots (claims) registered. The application, which will give cause for the collection of a fee of 5 francs (97 cents), will be examined within three months by the commissioner of mines. Before the end of the first month a notice designed for (general) information will be published within the mining district, at petitioner's expense, by means of posted placards.

A plat of the lot (claim) or group of lots (claims) must be drawn up at petitioner's expense. Contests may be set up by payment of a fee of 5 francs (97 cents). The three months' delay having expired, if no contest has been set up, the lot (claim) will be recorded in a special book and a certificate delivered to the applicant. The recording fee is 100 francs ($19.30) per lot (claim).

If a contest has been set up, the litigation must be brought within a fortnight before the French tribunal of the district.

No lot (claim) can be recorded as long as there are any rentals or fines due upon it.

Section III.—Concessions.

ART. 22. Associations established for the working of mines can claim the conversion into concessions of each group of contiguous lots (claims) which they hold, on condition of having previously obtained the resident-general's approval of their corporation articles.

The formality of application and inquiry are the same as those provided for in the preceding article for the registry of lots (claims), except that the application is

examined by the chief of the service of mines and that the publication includes, besides the posting of placards in the mining district, its insertion in the Official Journal of Madagascar.

Each concession must have a surface extent not smaller than 50 hectares (123.55 acres) or larger than 2,000 hectares (4,942 acres); the same association can not obtain more than ten concessions within the compass of the island.

ART. 23. The conversion of an ensemble of lots into a concession secures—

(1) All the advantages attaching to the registry of lots (claims), under the reservation that transfers of the concession shall be subject to the authorization of the resident-general.

(2) The right to choose between the surface rental established for lots (claims) and a special fiscal system, consisting of an annual surface tax equal to one-tenth of the monthly tax established for lots (claims) per hectare (2.471 acres) per year, and of an ad valorem tax of 5 per cent on the material extracted, to the extent of a total contribution equal to the half of the full surface tax. The fixed tax can not, nevertheless, fall below 5 francs (97 cents) per hectare (2.471 acres) per year.

ART. 24. The surface tax special to concessions is payable yearly in advance; the ad valorem tax is payable yearly, three months at the most after the expiration of the year upon whose production it is assessable.

The concession grantee must keep the books which are enjoined upon him by the administration for the purpose of controlling the production.

If one of the two taxes is not paid at due date, the procedure and consequence will be the same as that established by article 20 for registered lots (claims).

If the auction does not result in a sale, the concession is annulled and the ground can be again divided up into lots (claims).

Section IV.—Duties and obligations of those working mines toward third parties.

ART. 25. The ownership of the mine is distinct from that of the surface.

In the interior of every mining district, those who work mines have the right of establishing roadways and of using those which are established, to turn water courses and make canals, to cut timber, to occupy the ground inside and outside of their mining lots or concessions. In case of complaint by the proprietors or of the other miners, the performance of these operations will be made subject to an authorization from the commissioner of mines. In the carrying on of excavations the limitations of article 6 must be observed.

Taxes concerning rights of way, water rights, timber rights, and the occupation of ground on Government lands will be made, under proposal of the commissioner of mines, the object of tariffs, confirmed by the resident-general after notice from the director of domains.

ART. 26. Every miner is responsible for the temporary and permanent damages caused by his mining to the owner of the soil and to other miners. All temporary and permanent damages sustained by the lands or husbandry because of that mining gives cause for an indemnity in double the accruing injury.

The competent judge shall be the French judge whenever the dispute shall not have been raised wholly between natives.

Section V.—The traffic in gold, in the other precious metals, and in precious stones.

ART. 27. The traffic in gold, in the other precious metals, and in precious stones in a rough state can not be carried on but by means of the payment of an exceptional license fee of 1,800 francs ($347.40) per annum.

Miners who sell the product of their mines are not to be regarded as carrying on traffic.

Every trader in the before-named materials must keep the books which are enjoined upon him by the administration and hold them at the disposal of its appointed agents, who shall affix their "visas" thereto.

TITLE V.—PENALTIES.

ART. 28. Infractions of the provisions of the present law shall be denounced and verified the same as infractions in affairs of police. The commissioners of mines are officers of the police judiciary within the compass of their mining districts.

ART. 29. The procès-verbals against the offenders shall be drawn up by the officers of the police judiciary or be in their hands, confirmed under oath by the agents of the public force, within a month's time

ART. 30. The procès-verbals shall, according to the situation of the places, be addressed in original to the public prosecutor attached to the tribunal of the first instance, or to the officer of the public administration attached to the justice of peace, with extended jurisdiction, who will be obliged to prosecute the offenders of his own accord before the correctional sittings of the bench, without prejudice to the damages of the parties.

ART. 31. Fines of from 5 to 100 francs (97 cents to $19.30) and imprisonment for from one to five days may be imposed for infractions, other than those hereafter defined, of the provisions of the present law.

ART. 32. By a fine of from 100 to 1,000 francs ($19.30 to $193) and imprisonment for from one to five days are punished—

(1) Those who, without permits, engage in prospecting.

(2) Concession grantees and traders in precious substances who do not keep their books in a regular manner or refuse to show them to the agents of the administration. In the latter case, forfeiture of any precious substances seized will always be declared.

ART. 33. By a fine of from 100 to 1,000 francs ($19.30 to $193) and imprisonment for from fifteen days to two years are punished—

(1) Those who, in an unlawful way, set up, destroy, or displace prospecting signals.

(2) Those who, in an unlawful way, peg off or remove the pegs from off lots (claims).

(3) Those who falsify the dates inscribed upon their permits.

ART. 34. By a fine of from 1,000 to 25,000 francs ($193 to $4,825) and imprisonment for from three months to three years are punished those who, without permits, engage in the mining of precious substances, or, without licenses, in the traffic in such substances. The same penalty is applicable to those who carry on the trade of buying precious metals or precious stones in a rough state from a person not provided with a working permit or a selling license. The forfeiture of any substances seized will always be declared.

ART. 35. The misdemeanors provided against in articles 31, 32, 33, and 34 are given over to the French jurisdiction. Malagasy jurisdiction takes cognizance only of cases wherein no European [1] is implicated.

ART. 36. In every case where the penalty of imprisonment and that of a fine are provided for by the present law, if there are any extenuating circumstances, the tribunals are authorized, even in the case of repetition of the offense, to reduce the imprisonment to even below six days and the fine to even below 16 francs ($3.09); they may also pass sentence for one or the other of these penalties separately, but without such penalty being in any case below those of a police court.

ART. 37. Fines, as well as rentals and fees, are payable either in French specie or in rough gold, at the minimum standard of 90 per cent, valued at 2.70 francs (52 cents) per gram (15.432 grains).

MEXICO.

Respecting the production of gold in Mexico in 1896 this Bureau has received the following information :

The weight in kilograms, fine, of gold produced by the mines of the country in the year 1896 was 9,800 kilograms, of the value of $6,500,000.

[1] Malagasy text says "Vagaha" (foreigner); French text says "European."

Calculating the gold output of the country, as in previous years, by adding the coinage of gold in the Republic to its gold exports, a slightly different figure is reached. According to the official information, the coinage and exports of gold in 1896 were as follows:

Coinage	$560,000
Gold ore exported	213,005
Gold bars exported	5,370,809
Gold in cyanides	143,299
Gold in sulphides	19,610
Total	6,306,723

Or about $193,000 of Mexican coinage less than the product officially reported.

It is, however, clearly demonstrable that the gold yield of the Mexican mines in 1896 was larger than either of the amounts given above, and neither is, therefore, accepted by this Bureau. An independent calculation of Mexico's yield of gold in 1896 is, therefore, here made, thus:

Gold coined in Mexico	$560,000
Gold extracted in United States smelters and refineries from Mexican ores, etc	5,015,483
Mexican gold deposited at United States assay office, New York	570,484
Mexican gold deposited at United States mint at San Francisco	242,808
Total	6,388,775

The first of the items above given was obtained by this Bureau from the Mexican authorities, the second from the reports made to it by the smelting and refining companies of the United States, and the third and fourth from the superintendents of the United States assay office at New York and of the United States mint at San Francisco, respectively. The correspondence relating to the last two items is as follows:

THE UNITED STATES ASSAY OFFICE AT NEW YORK,
Superintendent's Office, January 29, 1897.

SIR: In response to your letter of the 28th instant, I give below a statement showing the amount of gold bullion (including partings) received on deposit at this institution from Mexico during the calendar year 1896, viz: Value, $570,483.86; ounces, standard, 30,663.507.

Respectfully, yours,

ANDREW MASON,
Superintendent.

Hon. R. E. PRESTON,
Director of the Mint, Washington, D. C.

MINT OF THE UNITED STATES AT SAN FRANCISCO,
SUPERINTENDENT'S OFFICE,
San Francisco, February 3, 1897.

SIR: Replying to yours of the 28th ultimo, in reference to gold and silver bullion deposited at this mint during calendar year 1896 from Mexico, I beg to report as follows: Gold, 13,050.927 standard ounces; value, $242,808. Silver, 4,053.99 standard ounces.

Respectfully, yours,

JOHN DAGGETT,
Superintendent.

Hon. R. E. PRESTON,
Director of the Mint, Washington.

The amount of fine gold contained in gold ore, bars, cyanides, and sulphides is undervalued by the Mexican authorities, as is plainly evident from the fact that from the Mexican gold ore, bars, etc., imported into the United States in 1896 a larger quantity of fine metal is extracted than the total amount reported as exported to all countries, the difference being $82,052, Mexican gold currency. But Mexico exports considerable quantities of gold ores, bars, etc., not only to the United States, but also to France and England. No statement of the exact amounts shipped to the two latter countries in 1896 has been received by this Bureau, but, basing an estimate of the same on the amounts exported thither in previous years, they may, it is believed, be safely assumed as equal to a minimum of one-third the amounts exported to the United States, and that the fine gold they contained was equal to one-third the amount extracted from Mexican ores, etc., in the United States.

The United States received from Mexico in 1896, $5,828,775, one-third of which is $1,942,925. Adding this amount to $6,388,775, obtained above, gives a probable gold product of Mexico in 1896 of $8,331,700, Mexican gold currency, corresponding to 12,536.413 kilograms, fine, at which figures the gold product of Mexico in 1896 appears in the table of the world's production in the present report.

The silver product of Mexico in 1896 consisted of the following items:

Coined	$21,000,000
Ore exported	9,528,686
In slag	43,990
In bars	26,595,649
In cyanides	29,873
In sulphides	903,426
Total	58,101,624

Representing 1,420,056.80 kilograms, fine, at the Mexican coining rate of 40.915 pesos.

NORWAY.

No information is obtainable as to the production of gold in Norway in 1896. The amount is certainly insignificant.

The silver yield of the Kongsberg mines from July 1, 1895, to June 30, 1896, was 5,046 kilograms, of the coining value of $209,711. The product of the calendar year was probably about the same.

PERU.

The gold production of Peru in 1895 was 175.403611 kilograms, of the value of $116,573.

Its silver product is estimated to be equal to the sum of the amount deposited at the mint and the amount exported, which was as follows:

	Kilograms fine.
Deposited at the mint	62,735.914
Exported	7,386.559
Total	70,122.473

of the coining value of $2,914,290, showing a decrease of 28,279 kilograms, of the coining value of $1,175,200, as compared with 1895.

[Extracts from No. 1866, Diplomatic and Consular Reports on Trade and Finance in Peru.]

From January, 1866, to November, 1896, there has been very little variation in the production of silver from the Cerro de Pasco district, as will be perceived by examining the following table:

STATEMENT OF SILVER PRODUCED AND MELTED INTO BARS AT CERRO DE PASCO FROM JANUARY, 1886, TO NOVEMBER, 1896, INCLUSIVE.

Year.	Number of bars.	Marks of 8 ounces.
1886	501	146,495
1887	459	137,160
1888	438	131,867
1889	538	161,682
1890	558	165,630
1891	536	159,629
1892	541	163,019
1893	555	166,480
1894	491	148,759
1895	575	174,866
1896 (from January to November)	530	158,386
Total	5,722	1,713,973

The auriferous deposits of Peru are in all probability of great importance, but the gold industry has been neglected hitherto. Some of the districts where the richest gold-bearing quartz veins or alluvia are found are very difficult of access at present. In the Amazonian region gold is found in many and well-known places, but the climate, want of labor, and unfriendliness of the Indian tribes are some of the chief obstacles which one encounters.

In Sir Charles E. Mansfield's report, published in the year 1890, in the Miscellaneous Series (No. 167), the chief auriferous deposits of Peru are indicated. This interesting paper, which was compiled from most reliable sources, contains nearly all the information available upon this important subject.

Considerable excitement was caused some time ago owing to the unusual production obtained from a mine denominated Santo Domingo, in the province of Carabaya, which forms part of the department of Puno. This lode, which has yielded over 30,000 ounces of gold within the last eighteen months, has now become the property of an American company, which paid £57,000 for it. Gold digging has been carried on in that district from time immemorial, and it is believed that the Inca sovereigns obtained large quantities of this precious metal from there.

RUSSIA.

The weight and value of the gold produced from the mines of Russia in 1896 was 32,404.142502 kilograms fine, of the value of $21,535,793, and the weight and value of the silver yield of the country, 10,457 kilograms fine, of the coining value of $434,590.

The gold product of Russia in 1896 was 11,072 kilograms, of the value of $7,358,620—less than in 1895.

SPAIN.

Spain produces no gold. No returns showing Spain's silver yield in 1896, have been received, and it is therefore assumed to have been the same as in 1895, viz, 109,804 kilograms, of the coining value of $4,563,454.

THE MINES OF GALICIA.[1]

[From Consular Report for March, 1897.]

GOLD MINES.

From a very remote period the Iberian peninsula has been celebrated for its mineral wealth. The Phœnicians and, later on, the Carthagenians worked the gold and silver mines of Spain. Hannibal extracted daily near Carthagena a quantity of those metals equivalent to 6,000 pesetas ($1,158). The most renowned of ancient historians mention the riches of Iberia in precious metals and relate that in the time of Justinian gold was found in the fields worked by the plow. Pliny the younger says that in his time 2,000 pounds of gold were extracted annually from Galicia, Asturias, and Portugal. The immense quantities of this metal drawn from Spain restored and replenished Rome's public treasury. Cato, on his return from governing Spain, handed over 18 tons of silver and nearly 2,000 kilograms of gold.

After the fall of the Roman Empire the mining industry received no great impulse from the Moors, and, finally, the discovery of the New World was the deathblow to the miner's industry in Spain. In fact, with the object of favoring in America an industry which was for them a source of great riches, the kings of Spain prohibited the working of mines in the peninsula.

To-day, however, owing to the persistent efforts of a few prospecting Englishmen and to the progress being made every year in processes for the extraction of refractory ores, it is probable that in a short time some of the old Roman mines will be worked on a large scale.

The gold is found in the northwestern part of Galicia, between the slate and granite formations. The ore is an iron pyrite containing a little arsenic. The lodes run generally with the formation north and south. They are well defined, and average about 14 feet in thickness. Assays have given up to 4 ounces of gold per ton and more, but the average is between 6 and 16 pennyweights to the ton.

The following is taken from the principal mines actually being developed in Galicia:

The Sagasta mines.—In these mines some 2,000 meters of levels and crosscuts have been driven, to fully prove the lodes. Last year a total of 1,095 meters were driven and 1,600 tons of ore were extracted, equal, according to assays, to 1,425 ounces of gold. No gold has been actually extracted, as the syndicate working these mines have not yet decided on what process they will adopt. Most likely it will be the cyanide process.

Fosas de Vila mines.—These mines have been proved by sinking pits, and are at the present time being offered to the French market. The assays give 18 pennyweights to 1 ounce of gold and 20 ounces of silver to the ton, besides containing a considerable quantity of lead. It is not yet known by what process they will be worked; probably by smelting.

Josefina mines.—These are of an arsenical iron pyrite. Assays made in Paris give over an ounce of gold and 2 to 30 grams silver to the ton.

The Buena Esperanza.—This mine is very much like the Josefina. It has a main lode over 2,000 meters long, about 4 feet wide, and a depth of more than 100 meters.

[1] I am indebted to Mr. Ernest J. Bayliss, C. E., agent for Fraser & Chalmers, Chicago and London, mining machinery manufacturers, for the information incorporated into this report.

The ore assays give 9 to 10 pennyweights to the ton, with less arsenic and more iron than the Josefina.

Virgen y S. Victor.—These are two mines on the same lode. The ore, although of a very complex nature, is very rich; but owing to difficulties which, I understand, are being overcome, nothing much has been done yet.

There are many other concessions taken up, but for want of capital are not being developed.

On the banks of the River Sil there are remains of important "placer workings," probably Roman, and even to-day a compensative quantity of gold is washed from the deposits in the banks of this river by the local peasant women, who stand in the shallow places and wash the stuff they have collected in "bateas" (wooden bowls), in the working of which they are adepts.

The general conditions for mining in this district are exceptionally good. Timber, labor, etc., is plentiful and cheap. Large quantities of pine props are shipped annually to Cardiff for coal mines. The cost of labor per day is as follows: Miners, carpenters, etc., 2.50 pesetas (48 cents); blacksmiths, 3.50 pesetas (67 cents); laborers, 1.50 pesetas (28 cents).

The country is well watered, and hydraulic power can be obtained actually on or near to almost all the mines. The only drawback is the cost of coal in cases where steam power would be required and for calcining when chlorination is the only way of extraction.

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JULIO HARMONY, *Consul.*

CORUNNA, *October 11, 1896.*

SWEDEN.

The gold product in Sweden in 1896 was 114.485 kilograms, of the value of $76,087; and the silver product, 554.561 kilograms, of the coining value of $23,043.40.

URUGUAY.

The gold product of Uruguay in 1896 is assumed, in the absence of any returns for the year, to have been 40.7 kilograms fine, of the value of $27,049.22. No silver mines are operated in the country.

VENEZUELA.

The gold mines of Guayana, the only ones in active operation, yielded in 1896 gold to a value of 4,914,344.20 bolivars, or $948,468, representing a weight of fine gold of 1,427.126 kilograms. No silver mines are worked in Venezuela.

YUKON DISTRICT.

For the production of gold in the Yukon district, see Canada.

PART III.

GENERAL STATISTICS.

I.—Deposits and Purchases of Gold and Silver, by Weight,

Description of deposits.	COINAGE MINTS.			
	Philadelphia.	San Francisco.	Carson.	New Orleans.
GOLD.	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*
Domestic bullion, unrefined	9,384.475	233,178.993	32,318.421	705.580
Domestic bullion:				
Refinery bars	1,499.662	672.311	.....	.....
Refined	41,298.590	944,391.138	.....	.....
Total domestic bullion	52,182.727	1,178,242.442	32,318.421	705.580
Domestic coin:				
Treasury transfers	59,344.720	.....	.....	.....
Mutilated and abraded	11,761.889	329.923	.....	658.945
Foreign bullion:				
Unrefined	5,120.148	17,762.466	.....	7,793,340
Refined	21.142	13,110.538	.....	.....
Foreign coin	31.974	450,339.094	3.760	238.763
Jewelers' bars, old plate, etc	38,124.260	1,446.380	1.593	4,054.415
Total deposits	166,586.860	1,661,230.843	32,323.774	13,451.043
Redeposits:				
Fine bars	3,952.582	19,772.943	.....	.....
Mint bars	537,644.873	.....	.....	.....
Unparted bars	420,459.632	10,807.852	.....	.....
Total gold received	1,128,643.947	1,691,811.638	32,323.774	13,451.043
SILVER.				
Domestic bullion:				
Unrefined	1,274.06	40,717.75	179,950.61	249.28
Refinery bars	.....	.....	.....	.....
Refined	.....	.....	.....	.....
Total domestic bullion	1,274.06	40,717.75	179,950.61	249.28
Domestic coin:				
Treasury transfers	1,899,863.83	757,875.18	.....	799,279.50
Mutilated	2,215.85	198.80	.....	639.53
Trade dollars	110.54	.....	.....	5.17
Foreign bullion:				
Unrefined	181.81	4,855.89	.....	1,232.24
Refined	.....	.....	.....	.....
Foreign coin	.....	.....	.25	4.33
Jewelers' bars, old plate, etc	74,106.55	452.95	.53	8,119.42
Total deposits	1,977,752.64	804,100.57	179,951.39	809,529.47
Redeposits:				
Fine bars	.....	.....	.....	.....
Unparted bars	100,159.05	7,142.72	.....	.....
Total silver received	2,077,911.69	811,243.29	179,951.39	809,529.47
Gold and silver deposits and purchases	2,144,339.500	2,465,331.413	212,275.164	822,980.513
Redeposits:				
Gold	962,057.087	30,580.795	.....	.....
Silver	100,159.05	7,142.72	.....	.....
Total gold and silver received	3,206,555.637	2,503,054.928	212,275.164	822,980.513

DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

ASSAY OFFICES.						Total.
New York.	Denver.	Boise.	Helena.	Charlotte.	St. Louis.	
Standard ozs.	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*
341,626.347	130,324.697	56,793.920	114,338.916	11,234.752	1,254.944	931,161.045
265,917.744	94,544.552	.....	.....	2,165.398	1,358.151	366,157.818
836,971.630	121.184	.....	4,117.010	.....	338.678	1,827,238.230
1,444,515.721	224,990.433	56,793.920	118,455.926	13,400.150	2,951.773	3,124,557.093
.....	.....	.....	.....	.....	.....	59,344.720
31,196.504	6.570	1.070	.....	.....	57.561	44,012.462
106,137.310	19.936	.....	4,085.651	.....	84.689	141,003.540
559,133.108	.....	.....	.....	.....	40.478	572,305.266
377,456.057	.....	.....	.....	.....	15.810	828,085.458
113,926.034	1,351.308	.....	101.678	335.637	2,572.397	161,913.702
2,632,364.734	226,368.247	56,794.990	122,643.255	13,735.787	5,722.708	4,931,222.241
323,312.945	.....	.....	.....	.....	.....	347,038.470
.....	.....	.....	.....	.....	.....	537,644.873
3,033.118	395.597	11,986.116	1,009.417	7.969	6.522	447,706.223
2,958,710.797	226,763.844	68,781.106	123,652.672	13,743.756	5,729.230	6,263,611.807
220,466.35	38,387.53	14,055.38	36,079.49	1,251.50	243.05	532,675
82,125.09	6,699.56	.....	.....	25.60	12.17	88,862.42
3,702,320.75	.....	.....	.....	.....	.....	3,702,320.75
4,004,912.19	45,087.09	14,055.38	36,079.49	1,277.10	255.22	4,323,858.17
.....	.....	.....	.....	.....	.....	3,457,018.51
620.02	.....	.....	.....	.....	.....	3,674.20
.....	.....	.....	.....	.....	.....	115.71
773,180.44	.43	.....	1,966.24	.....	9.57	781,426.62
5,326.23	.....	.....	.....	.....	.....	5,326.23
188,429.47	.....	.....	.....	.....	.....	188,434.05
500,133.43	394.12	.....	25.03	146.09	890.84	584,268.96
5,472,601.78	45,481.64	14,055.38	38,070.76	1,423.19	1,155.63	9,344,122.45
14,506.49	.....	.....	.....	.....	.....	14,506.49
1,799.12	139.98	2,461.42	464.28	1.31	1.01	112,168.89
5,488,907.39	45,621.62	16,516.80	38,535.04	1,424.50	1,156.64	9,470,797.83
8,104,966.514	271,849.887	70,850.370	160,714.015	15,158.977	6,878.338	14,275,344.691
326,346.063	395.597	11,986.116	1,009.417	7.969	6.522	1,332,389.566
16,305.61	139.98	2,461.42	464.28	1.31	1.01	126,675.38
8,447,618.187	272,385.464	85,297.906	162,187.712	15,168.256	6,885.870	15,734,409.637

II.—Deposits and Purchases of Gold and Silver, by Value,

Description of deposits.	COINAGE MINTS.			
	Philadelphia.	San Francisco.	Carson.	New Orleans.
GOLD.				
Domestic bullion:				
Unrefined	$174,594.88	$4,338,213.82	$601,272.95	$13,127.07
Refinery bars	27,900.69	12,508.11	.....	.....
Refined	768,345.86	17,570,067.68	.....	.....
Total domestic bullion	970,841.43	21,920,789.61	601,272.95	13,127.07
Domestic coin:				
Treasury transfers	1,104,087.82	.....	.....	.....
Mutilated and abraded	218,825.83	6,138.10	.....	12,259.44
Foreign bullion:				
Unrefined	95,258.57	330,464.48	.....	144,992.37
Refined	393.34	243,916.99	.....	.....
Foreign coin	594.87	8,378,401.75	69.95	4,442.10
Jewelers' bars, old plate, etc	709,288.56	26,909.40	29.64	75,430.98
Total deposits	3,099,290.42	30,906,620.33	601,372.54	250,251.96
Redeposits:				
Fine bars	73,536.41	367,868.71	.....	.....
Mint bars	10,002,695.31	.....	.....	.....
Unparted bars	7,822,504.78	201,076.32	.....	.....
Total gold received	20,998,026.92	31,475,565.36	601,372.54	250,251.96
SILVER.				
Domestic bullion:				
Unrefined	1,482.54	47,380.65	209,397.07	290.07
Refinery bars	.....	.....	.....	.....
Refined	.....	.....	.....	.....
Total domestic bullion	1,482.54	47,380.65	209,397.07	290.07
Domestic coin:				
Treasury transfers	2,210,750.64	881,891.12	.....	930,070.69
Mutilated	2,578.44	231.33	.....	744.18
Trade dollars	128.63	.....	.....	6.02
Foreign bullion:				
Unrefined	211.56	5,650.49	.....	1,433.88
Refined	.....	.....	.....	.....
Foreign coin	.....	.....	.29	5.04
Jeweler's bars, old plate, etc	86,233.08	527.07	.62	9,448.05
Total deposits	2,301,384.89	935,680.66	209,397.98	941,997.93
Redeposits:				
Fine bars	.....	.....	.....	.....
Unparted bars	116,548.71	8,311.53	.....	.....
Total silver received	2,417,933.60	943,992.19	209,397.98	941,997.93
Gold and silver deposits and purchases	5,400,675.31	31,842,300.99	810,770.52	1,192,249.89
Redeposits:				
Gold	17,898,736.50	568,945.03	.....	.....
Silver	116,548.71	8,311.53	.....	.....
Total gold and silver received	23,415,960.52	32,419,557.55	810,770.52	1,192,249.89

DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

ASSAY OFFICES.						Total.
New York.	Denver.	Boise.	Helena.	Charlotte.	St. Louis.	
$6,355,839.02	$2,424,645.53	$1,056,631.07	$2,127,235.64	$209,018.64	$23,347.79	$17,323,926.41
4,947,306.87	1,758,968.41	.....	.....	40,286.48	25,267.93	6,812,238.49
15,571,565.21	2,254.58	.....	76,595.53	.....	6,300.99	33,995,129.85
26,874,711.10	4,185,868.52	1,056,631.07	2,203,831.17	249,305.12	54,916.71	58,131,294.75
.....	.....	.....	.....	.....	.....	1,104,087.82
580,400.08	122.23	19.90	.....	.....	1,070.90	818,836.48
1,974,647.62	370.90	.....	76,012.11	.....	1,575.61	2,623,321.66
10,402,476.43	.....	.....	.....	.....	753.08	10,647,539.84
7,022,438.27	.....	.....	.....	.....	294.14	15,406,241.08
2,119,554.12	25,140.61	.....	1,891.68	6,244.41	47,858.55	3,012,347.95
48,974,227.62	4,211,502.26	1,056,650.97	2,281,734.96	255,549.53	106,468.99	91,743,669.58
6,015,124.56	.....	.....	.....	.....	.....	6,456,529.68
.....	.....	.....	.....	.....	.....	10,002,695.31
56,430.10	7,359.94	222,997.51	18,779.85	148.26	121.34	8,329,418.10
55,045,782.28	4,218,862.20	1,279,648.48	2,300,514.81	255,697.79	106,590.33	116,532,312.67
256,542.65	44,669.12	16,355.34	41,983.40	1,456.29	282.82	619,839.95
95,563.74	7,795.85	.....	.....	29.79	14.16	103,403.54
4,308,155.05	.....	.....	.....	.....	.....	4,308,155.05
4,660,261.44	52,464.97	16,355.34	41,983.40	1,486.08	296.98	5,031,398.54
.....	.....	.....	.....	.....	.....	4,022,712.45
721.48	.....	.....	.....	.....	.....	4,275.43
.....	.....	.....	.....	.....	.....	134.65
899,700.89	.50	.....	2,287.99	.....	11.14	909,296.45
6,197.79	.....	.....	.....	.....	.....	6,197.79
219,263.38	.....	.....	.....	.....	.....	219,268.71
581,973.45	458.60	.....	29.12	170.00	1,036.61	679,876.60
6,368,118.43	52,924.07	16,355.34	44,300.51	1,656.08	1,344.73	10,873,160.62
16,880.28	.....	.....	.....	.....	.....	16,880.28
2,093.52	162.88	2,864.20	540.25	1.52	1.17	130,523.78
6,387,092.23	53,086.95	19,219.54	44,840.76	1,657.60	1,345.90	11,020,564.68
55,342,346.05	4,264,426.33	1,073,006.31	2,326,035.47	257,205.61	107,813.72	102,616,830.20
6,071,554.66	7,359.94	222,997.51	18,779.85	148.26	121.34	24,788,643.09
18,973.80	162.88	2,864.20	540.25	1.52	1.17	147,404.06
61,432,874.51	4,271,949.15	1,298,868.02	2,345,355.57	257,355.39	107,936.23	127,552,877.35

III.—Deposits of Unrefined Gold of Domestic Production, with the States Bullion not Distributed, by Weight, during

	Source.	COINAGE MINTS.			
		Philadelphia.	San Francisco.	Carson.	New Orleans.
		Standard ozs.	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*
1	Alabama				217.175
2	Alaska	278.232	25,993.619		
3	Arizona	245.307	30,406.798		
4	California	120.650	147,402.713	13,631.127	1.359
5	Colorado	2,047.547	9.913		63.027
6	Georgia	1,323.772			
7	Idaho	73.239	4,608.182		
8	Iowa	52.205			
9	Maryland	17.864			
10	Michigan	105.447			
11	Minnesota	43.733			
12	Montana	25.830	857.814		
13	Nevada		3,922.004	18,687.294	
14	New Mexico	6.081	55.444		386.394
15	North Carolina	257.462			
16	Oregon	14.463	10,407.704		
17	South Carolina	221.223			
18	South Dakota	3,719.105			
19	Tennessee	11.528			
20	Texas				37.625
21	Utah		4,495.124		
22	Vermont	53.186			
23	Virginia	174.918			
24	Washington	3.240	5,003.771		
25	Wyoming	112.551			
26	Other sources	476.892	15.907		
	Total unrefined	9,384.475	233,178.993	32,318.421	705.580
	Refinery bars (fineness less than 0.992)	1,499.662	672.311		
	Total	10,884.137	233,851.304	32,318.421	705.580

AND TERRITORIES PRODUCING THE SAME, AND OF REFINERY BARS OF DOMESTIC THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

ASSAY OFFICES.						Total.	
New York.	Denver.	Boise.	Helena.	Charlotte.	St. Louis.		
Standard ozs.	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	
1.409	.....	.....	.....	77.935	7.779	304.298	1
209.820	76.082	.....	5,486.720	.....	.....	32,044.473	2
956.162	5,050.950	.....	.....	.....	.....	36,659.217	3
227.094	25.690	.....	.....	.....	41.176	161,449.209	4
33,947.931	115,666.075	.....	.....	.....	424.574	152,159.067	5
58.762	.....	.....	.....	5,994.178	.....	7,376.712	6
2,766.344	420.165	30,770.792	22,668.529	.....	34.443	61,341.694	7
.....	.....	.....	.....	.....	.....	52.205	8
.....	.....	.....	.....	.....	.....	17.864	9
1,498.961	.....	.....	.....	.....	.....	1,604.408	10
.....	.....	.....	.....	.....	.....	43.733	11
10,861.800	48.448	.....	79,466.383	.....	30.525	91,290.800	12
82,181.922	133.466	.....	.....	.....	.....	104,924.686	13
2,552.837	5,861.715	.....	.....	.....	716.447	9,578.918	14
149.873	.....	.....	.....	1,974.324	.....	2,381.659	15
.....	146.129	25,960.780	1,904.538	.....	.....	38,433.614	16
.....	.....	.....	.....	3,182.664	.....	3,403.887	17
197,611.507	1,207.080	.....	.....	.....	.....	202,537.692	18
6.152	.....	.....	.....	.....	.....	17.680	19
.....	.....	.....	.....	.....	.....	37.625	20
3,453.968	1,053.990	.....	14.918	.....	.....	9,018.000	21
.....	.....	.....	.....	.....	.....	53.186	22
4.804	.....	.....	.....	5.651	.....	185.373	23
.....	.....	62.348	4,777.279	.....	.....	9,846.638	24
.....	635.507	.....	20.549	.....	.....	768.607	25
5,137.001	.....	.....	.....	.....	.....	5,629.800	26
341,626.347	130,324.697	56,793.920	114,338.916	11,234.752	1,254.944	931,161.045	
265,917.744	94,544.552	.....	.....	2,165.398	1,358.151	366,157.818	
607,544.091	224,869.249	56,793.920	114,338.916	13,400.150	2,613.095	1,297,318.863	

IV.—Deposits of Unrefined Gold of Domestic Production, with the States Bullion not Distributed, by Value, during

	Source.	COINAGE MINTS.			
		Philadelphia.	San Francisco.	Carson.	New Orleans.
1	Alabama				$4,040.47
2	Alaska	$5,176.41	$483,602.21		
3	Arizona	4,563.85	565,707.87		
4	California	2,244.65	2,742,376.06	$253,602.36	25.28
5	Colorado	38,093.90	184.43		1,172.60
6	Georgia	24,628.32			
7	Idaho	1,362.59	85,733.62		
8	Iowa	971.25			
9	Maryland	332.35			
10	Michigan	1,961.80			
11	Minnesota	813.64			
12	Montana	480.56	15,959.33		
13	Nevada		72,967.52	347,670.59	
14	New Mexico	113.13	1,031.52		7,188.72
15	North Carolina	4,789.99			
16	Oregon	269.08	193,631.70		
17	South Carolina	4,115.78			
18	South Dakota	69,192.65			
19	Tennessee	214.47			
20	Texas				700.00
21	Utah		83,630.21		
22	Vermont	989.51			
23	Virginia	3,254.29			
24	Washington	60.28	93,093.41		
25	Wyoming	2,093.97			
26	Other sources	8,872.41	295.94		
	Total unrefined	174,594.88	4,338,213.82	601,272.95	13,127.07
	Refinery bars (fineness less than 0.992)	27,900.69	12,508.11		
	Total	202,495.57	4,350,721.93	601,272.95	13,127.07

AND TERRITORIES PRODUCING THE SAME, AND OF REFINERY BARS OF DOMESTIC THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

ASSAY OFFICES.						Total.	
New York.	Denver.	Boise.	Helena.	Charlotte.	St. Louis.		
$26.21	.....	.....	.....	.....	$144.72	$4,211.40	1
3,903.63	$1,415.48	.....	$102,078.52	$1,449.95	.....	597,626.20	2
17,789.06	93,971.16	.....	.....	.....	.....	682,031.94	3
4,225.00	466.79	.....	.....	.....	766.06	3,003,706.20	4
631,589.41	2,151,926.98	.....	.....	.....	7,899.05	2,830,866.37	5
1,093.25	.....	.....	.....	111,519.59	.....	137,241.16	6
51,466.86	7,817.02	$572,479.85	421,740.08	.....	640.80	1,141,240.82	7
.....	.....	.....	.....	.....	.....	971.25	8
.....	.....	.....	.....	.....	.....	332.35	9
27,887.65	.....	.....	.....	.....	.....	29,849.45	10
.....	.....	.....	.....	.....	.....	813.64	11
202,080.00	901.36	.....	1,478,444.33	.....	567.91	1,698,433.49	12
1,528,966.00	2,483.09	.....	.....	.....	.....	1,952,687.20	13
47,494.64	109,055.16	.....	.....	.....	13,329.25	178,212.42	14
2,788.33	.....	.....	.....	36,731.61	.....	44,309.93	15
.....	2,718.68	482,991.26	35,433.26	.....	.....	715,043.98	16
.....	.....	.....	.....	59,212.35	.....	63,328.13	17
3,676,493.16	22,457.30	.....	.....	.....	.....	3,768,143.11	18
114.45	.....	.....	.....	.....	.....	328.92	19
.....	.....	.....	.....	.....	.....	700.00	20
64,259.87	19,609.12	.....	277.54	.....	.....	167,776.74	21
.....	.....	.....	.....	.....	.....	989.51	22
89.38	.....	.....	.....	105.14	.....	3,448.81	23
.....	.....	1,159.96	88,879.60	.....	.....	183,193.25	24
.....	11,823.39	.....	382.31	.....	.....	14,299.67	25
95,572.12	.....	.....	.....	.....	.....	104,740.47	26
6,355,839.02	2,424,645.53	1,056,631.07	2,127,235.64	209,018.64	23,347.79	17,323,926.41	
4,947,306.87	1,758,968.41	.....	.....	40,286.48	25,267.93	6,812,238.49	
11,303,145.89	4,183,613.94	1,056,631.07	2,127,235.64	249,305.12	48,615.72	24,136,164.90	

V.—Deposits of Unrefined Silver of Domestic Production, with the States Bullion not Distributed, by Weight, during

	Source.	Coinage mints.			
		Philadelphia.	San Francisco.	Carson.	New Orleans.
		Standard ozs.	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*
1	Alabama	.....	.....	.....	54.87
2	Alaska	66.35	5,009.49	.....	.....
3	Arizona	67.92	7,932.63	.....	.....
4	California	11.08	21,810.51	31,882.07	.19
5	Colorado	392.32	3.65	.....	23.81
6	Georgia	77.77	.....	.....	.....
7	Idaho	15.10	1,075.55	.....	.....
8	Iowa	3.94	.....	.....	.....
9	Maryland	.38	.....	.....	.....
10	Michigan	7.29	.....	.....	.....
11	Minnesota	10.94	.....	.....	.....
12	Montana	19.97	210.80	.....	.....
13	Nevada	.....	1,071.56	148,068.54	.....
14	New Mexico	1.36	17.02	.....	163.95
15	North Carolina	48.30	.....	.....	.....
16	Oregon	1.19	1,554.43	.....	.....
17	South Carolina	58.52	.....	.....	.....
18	South Dakota	334.54	.....	.....	.....
19	Tennessee	.64	.....	.....	.....
20	Texas	.....	.....	.....	6.46
21	Utah	.....	1,116.87	.....	.....
22	Vermont	6.22	.....	.....	.....
23	Virginia	12.28	.....	.....	.....
24	Washington	.97	912.07	.....	.....
25	Wyoming	19.55	.....	.....	.....
26	Other sources	117.43	3.17	.....	.....
	Total unrefined	1,274.06	40,717.75	179,950.61	249.28
	Refinery bars (fineness less than 0.992)	.....	.....	.....	.....
	Total	1,274.06	40,717.75	179,950.61	249.28

AND TERRITORIES PRODUCING THE SAME, AND OF REFINERY BARS OF DOMESTIC THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

ASSAY OFFICES.						Total.	
New York.	Denver.	Boise.	Helena.	Charlotte.	St. Louis.		
Standard ozs.	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	
.01	.....	.....	.....	4.75	2.16	61.79	1
37.95	14.94	.....	1,053.78	.....	.....	6,182.51	2
251.04	836.65	.....	.....	.....	.....	9,088.24	3
46.31	10.51	.....	.....	.....	4.49	53,765.16	4
11,299.12	35,325.26	.....	.....	.....	160.79	47,204.95	5
2.78	.....	.....	.....	554.75	.....	635.30	6
700.04	36.50	8,342.63	3,418.63	.....	10.44	13,598.89	7
.....	.....	.....	.....	.....	.....	3.94	8
.....	.....	.....	.....	.....	.....	.38	9
40,450.89	.....	.....	.....	.....	.....	40,458.18	10
.....	.....	.....	.....	.....	.....	10.94	11
22,958.75	15.51	.....	30,186.49	.....	4.16	53,395.68	12
87,129.42	105.38	.....	.....	.....	.....	236,374.90	13
2,106.58	1,260.96	.....	.....	.....	61.01	3,610.88	14
23.05	.....	.....	.....	453.32	.....	524.67	15
.....	20.58	5,701.47	418.65	.....	.....	7,696.32	16
.....	.....	.....	.....	238.28	.....	296.80	17
39,729.00	146.04	.....	.....	.....	.....	40,209.58	18
.34	.....	.....	.....	.....	.....	.98	19
.....	.....	.....	.....	.....	.....	6.46	20
4,206.01	535.35	.....	.34	.....	.....	5,858.57	21
.....	.....	.....	.....	.....	.....	6.22	22
.73	.....	.....	.....	.40	.....	13.41	23
.....	.....	11.28	1,000.34	.....	.....	1,924.66	24
.....	79.85	.....	1.26	.....	.....	100.66	25
11,524.33	.....	.....	.....	.....	.....	11,644.93	26
220,466.35	38,387.53	14,055.38	36,079.49	1,251.50	243.05	532,675.00	
82,125.09	6,699.56	.....	.....	25.60	12.17	88,862.42	
302,591.44	45,087.09	14,055.38	36,079.49	1,277.10	255.22	621,537.42	

VI.—Deposits of Unrefined Silver of Domestic Production, with the Domestic Bullion not Distributed, by Value,

	Source.	COINAGE MINTS.			
		Philadelphia.	San Francisco.	Carson.	New Orleans.
1	Alabama				$63.85
2	Alaska	$77.21	$5,829.22		
3	Arizona	79.03	9,230.70		
4	California	12.89	25,379.50	$37,099.13	.22
5	Colorado	456.52	4.25		27.70
6	Georgia	90.50			
7	Idaho	17.57	1,251.55		
8	Iowa	4.59			
9	Maryland	.44			
10	Michigan	8.48			
11	Minnesota	12.73			
12	Montana	23.24	245.29		
13	Nevada		1,246.90	172,297.94	
14	New Mexico	1.58	19.80		190.78
15	North Carolina	56.20			
16	Oregon	1.38	1,808.80		
17	South Carolina	68.10			
18	South Dakota	389.28			
19	Tennessee	.74			
20	Texas				7.52
21	Utah		1,299.63		
22	Vermont	7.24			
23	Virginia	14.29			
24	Washington	1.13	1,061.32		
25	Wyoming	22.75			
26	Other sources	136.65	3.69		
	Total unrefined	1,482.54	47,380.65	209,397.07	290.07
	Refinery bars (fineness less than 0.992)				
	Total	1,482.54	47,380.65	209,397.07	290.07

STATES AND TERRITORIES PRODUCING THE SAME, AND OF REFINERY BARS OF DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

ASSAY OFFICES.						Total.	
New York.	Denver.	Boise.	Helena.	Charlotte.	St. Louis.		
$0.01	.....	.....	.....	$5.53	$2.51	$71.90	1
44.16	$17.38	.....	$1,226.21	.....	.....	7,194.18	2
292.12	973.56	.....	.....	.....	.....	10,575.41	3
53.89	12.23	.....	.....	.....	5.23	62,563.09	4
13,148.07	41,105.75	.....	.....	.....	187.10	54,929.39	5
3.23	.....	.....	.....	645.52	.....	739.25	6
814.59	42.47	$9.707.78	3,978.03	.....	12.15	15,824.14	7
.....	.....	.....	.....	.....	.....	4.59	8
.....	.....	.....	.....	.....	.....	.44	9
47,070.13	.....	.....	.....	.....	.....	47,078.61	10
.....	.....	.....	.....	.....	.....	12.73	11
26,715.64	18.05	.....	35,126.10	.....	4.84	62,133.16	12
101,386.96	122.62	.....	.....	.....	.....	275,054.42	13
2,451.29	1,467.30	.....	.....	.....	70.99	4,201.74	14
26.82	.....	.....	.....	527.50	.....	610.52	15
.....	23.95	6,634.44	487.16	.....	.....	8,955.73	16
.....	.....	.....	.....	277.27	.....	345.37	17
46,230.11	169.94	.....	.....	.....	.....	46,789.33	18
.39	.....	.....	.....	.....	.....	1.13	19
.....	.....	.....	.....	.....	.....	7.52	20
4,894.26	622.95	.....	.40	.....	.....	6,817.24	21
.....	.....	.....	.....	.....	.....	7.24	22
.85	.....	.....	.....	.47	.....	15.61	23
.....	.....	13.12	1,164.03	.....	.....	2,239.60	24
.....	92.92	.....	1.47	.....	.....	117.14	25
13,410.13	.....	.....	.....	.....	.....	13,550.47	26
256,542.65	44,669.12	16,355.34	41,983.40	1,456.29	282.82	619,839.95	
95,563.74	7,795.85	.....	.....	29.79	14.16	103,403.54	
352,106.39	52,464.97	16,355.34	41,983.40	1,486.08	296.98	723,243.49	

VII.—Bars Manufactured of Gold and Silver, by Weight,

Description.	COINAGE MINTS.			
	Philadelphia.	San Francisco.	Carson.	New Orleans.
GOLD.	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*
Fine bars	51,685.175		19,772.943	13.914
Mint bars				
Standard bars	95,377.780			
Unparted bars				
Total gold	147,062.955		19,772.943	13.914
SILVER.				
Fine bars	57,331.84		195,978.73	6,572.64
Mint bars				
Unparted bars				
Total silver	57,331.84		195,978.73	6,572.64

VIII.—Bars Manufactured of Gold and Silver, by Value,

Description.	COINAGE MINTS.			
	Philadelphia.	San Francisco.	Carson.	New Orleans.
GOLD.				
Fine bars	$961,584.65		$367,868.71	$258.87
Mint bars				
Standard bars	1,774,470.33			
Unparted bars				
Total gold	2,736,054.98		367,868.71	258.87
SILVER.				
Fine bars	66,713.41		228,047.98	7,648.16
Mint bars				
Unparted bars				
Total silver	66,713.41		228,047.98	7,648.16
Total gold and silver bars	2,802,768.39		595,916.69	7,907.03

DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

ASSAY OFFICES.						Total.
New York.	Denver.	Boise.	Helena.	Charlotte.	St. Louis.	
Standard ozs.	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*
2,394,716.155	.....	.....	.....	.....	.....	2,466,188.187
358,453.062	.....	.....	.....	.....	.....	358,453.062
147,410.373	.....	.....	.....	.....	.....	242,788.153
.....	226,763.844	68,781.106	123,652.672	13,743.756	5,729.230	438,670.608
2,900,579.590	226,763.844	68,781.106	123,652.672	13,743.756	5,729.230	3,506,100.010
5,286,885.48	.....	.....	.....	.....	.....	5,546,768.69
11,297.95	.....	.....	.....	.....	.....	11,297.95
.....	45,621.62	16,516.80	38,535.04	1,424.50	1,156.64	103,254.60
5,298,183.43	45,621.62	16,516.80	38,535.04	1,424.50	1,156.64	5,661,321.24

DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

ASSAY OFFICES.						Total.
New York.	Denver.	Boise.	Helena.	Charlotte.	St. Louis.	
$44,552,858.70	.....	.....	.....	.....	.....	$45,882,570.93
6,668,894.18	.....	.....	.....	.....	.....	6,668,894.18
2,742,518.57	.....	.....	.....	.....	.....	4,516,988.90
.....	$4,218,862.20	$1,279,648.50	$2,300,514.81	$255,697.79	$106,590.33	8,161,313.63
53,964,271.45	4,218,862.20	1,279,648.50	2,300,514.81	255,697.79	106,590.33	65,229,767.64
6,152,012.19	.....	.....	.....	.....	.....	6,454,421.74
13,146.70	.....	.....	.....	.....	.....	13,146.70
.....	53,086.95	19,219.54	44,840.76	1,657.60	1,345.90	120,150.75
6,165,158.89	53,086.95	19,219.54	44,840.76	1,657.60	1,345.90	6,587,719.19
60,129,430.34	4,271,949.15	1,298,868.04	2,345,355.57	257,355.39	107,936.23	71,817,486.83

IX.—STATEMENT OF DOMESTIC MUTILATED AND UNCURRENT GOLD AND SILVER FOR RECOINAGE, SHOWING WEIGHT, FACE VALUE, COINING VALUE,

Denomination.	PHILADELPHIA.		SAN FRANCISCO.	
	Received from Treasury.	Purchased.	Received from Treasury.	Purchased.
GOLD.				
Double eagles	$309,820.00	$64,700.00	.....	$4,080.00
Eagles	263,260.00	69,620.00	.....	860.00
Half eagles	524,390.00	81,735.00	.....	1,635.00
Three-dollar pieces	21.00	69.00	.....	21.00
Quarter eagles	15,842.50	3,202.50	.....	97.50
Dollars	31.50	305.00	.....	31.00
Total gold, face value	1,113,365.00	219,631.50	.....	6,724.50
SILVER.				
Trade dollar	.....	128.00	.....	.....
Standard dollar	.....	914.00	.....	.....
Half dollar	623,089.50	773.00	$789,000.00	112.50
Quarter dollar	1,322,019.75	710.75	154,000.00	56.50
Twenty-cent pieces	336.80	.....	15.80	.20
Dimes	568,953.70	340.00	34,000.00	89.40
Half dimes	3,208.90	35.40	228.05	6.55
Three-cent pieces	387.46	1.20	.....	.15
Total silver, face value	2,517,996.11	2,902.35	977,243.85	265.30
SUMMARY.	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*
Gold coin	59,344.720	11,761.889	.....	329.923
Silver coin	1,899,863.83	2,215.85	757,875.18	198.80
Gold, coining value	$1,104,087.82	$218,825.84	.....	$6,138.10
Silver, subsidiary, coining value	2,363,749.70	2,756.89	$942,924.00	247.34
Silver, dollar, coining value	2,210,750.64	2,578.44	881,891.12	231.33
Loss, gold	9,277.18	805.66	.....	586.40
Loss, silver, subsidiary	154,246.41	17.46	34,319.85	17.96

GOLD COINS.

	Face value.	Fine ounces.	Coining value.
Received from Treasury on transfer orders	$1,113,365.00	53,410.248	$1,104,087.82
Received over the counter	825,808.00	39,611.216	818,836.49
Total	1,939,173.00	93,021.464	1,922,924.31

COINS TRANSFERRED FROM THE TREASURY AND PURCHASED OVER THE COUNTER AND LOSS DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

NEW ORLEANS.		NEW YORK.	DENVER	BOISE.	ST. LOUIS.	TOTAL.		
Received from Treasury.	Purchased.	Purchased.	Purchased.	Purchased.	Purchased.	Received from Treasury.	Purchased.	Received from Treasury and purchased.
.....	$5,080.00	$164,980.00	$20.00	$20.00	$440.00	$309,820.00	$239,320.00	$549,140.00
.....	1,470.00	244,900.00	70.00	.....	150.00	263,260.00	317,070.00	580,330.00
.....	5,640.00	163,830.00	25.00	.....	470.00	524,390.00	253,335.00	777,725.00
.....	.....	171.00	3.00	.....	.....	21.00	264.00	285.00
.....	187.50	11,555.00	7.50	.....	25.00	15,842.50	15,075.00	30,917.50
.....	9.00	393.00	2.00	.....	4.00	31.50	744.00	775.50
.....	12,386.50	585,829.00	127.50	20.00	1,089.00	1,113,365.00	825,808.00	1,939,173.00
.....	6.00	.....	.....	.....	.....	.....	134.00	134.00
.....	235.00	154.00	.....	.....	.....	.....	1,303.00	1,303.00
$454,600.00	340.50	292.50	.....	.....	.....	1,866,689.50	1,518.50	1,868,208.00
488,000.00	123.25	259.25	.....	.....	.....	1,964,019.75	1,149.75	1,965,169.50
30.00	.....	.....	.....	.....	.....	382.60	.20	382.80
109,210.00	105.90	109.10	.....	.....	.....	712,163.70	644.40	712,808.10
160.00	16.90	.50	.....	.....	.....	3,596.95	59.35	3,656.30
.....	.03	.....	.....	.....	.....	387.46	1.38	388.84
1,052,000.00	827.58	815.35	.....	.....	.....	4,547,239.96	4,810.58	4,552,050.54
Standard ozs.	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*	*Standard ozs.*
.....	658.945	31,196.504	6.570	1.070	57.561	59,344.720	44,012.462	103,357.182
799,279.50	639.53	.....	.....	.....	.....	3,457,018.51	*a*3,674.20	3,460,692.71
.....	$12,259.44	$580,400.08	$122.23	$19.90	$1,070.90	$1,104,087.82	$818,836.49	$1,922,924.31
$994,437.95	795.68	771.41	.....	.....	.....	4,301,111.65	*a*4,571.32	4,305,682.97
930,070.69	744.18	721.48	.....	.....	.....	4,022,712.45	*a*4,275.43	4,026,987.88
.....	127.06	5,428.92	5.27	.10	18.10	9,277.18	6,971.51	16,248.69
57,562.05	25.90	43.94	.....	.....	.....	246,128.31	*a*105.26	256,233.57

SILVER COINS.

	Face value.	Fine ounces.	Coining value.
Received from Treasury on transfer orders.....	$4,547,239.96	3,111,316.66	$4,022,712.45
Received over the counter	*a*4,676.58	3,306.78	*a*4,275.43
Total	4,551,916.54	3,114,623.44	4,026,987.88

a Trade dollars not included.

X.—Quantity and Cost of Silver Used in the Coinage of Silver Dollars during the Calendar Year 1896, under Act of July 14, 1890.

MINT AT PHILADELPHIA.

Month.	COINED.		Dollars coined.	Seigniorage.
	Ounces, standard.	Cost.		
1896.				
January				
February	773,437.50	$630,051.71	900,000	$269,948.29
March	773,684.14	630,252.62	900,287	270,034.38
April	773,437.50	630,051.71	900,000	269,948.29
May	773,437.50	630,051.71	900,000	269,948.29
June	773,544.92	630,139.21	900,125	269,985.79
July	139,218.75	113,409.31	162,000	48,590.69
August	1,117,187.50	910,074.69	1,300,000	389,925.31
September	1,117,273.44	910,144.70	1,300,100	389,955.30
October	1,031,250.00	840,068.94	1,200,000	359,931.06
November	441,718.75	359,829.53	514,000	154,170.47
December	859,589.84	700,232.46	1,000,250	300,017.54
Total	8,573,779.84	6,984,306.59	9,976,762	2,992,455.41

MINT AT SAN FRANCISCO.

January				
February	85,937.50	$69,258.31	100,000	$30,741.69
March	85,937.50	69,258.31	100,000	30,741.69
April	214,843.75	173,145.79	250,000	76,854.21
May	257,812.50	207,768.28	300,000	92,231.72
June	257,812.50	207,768.28	300,000	92,231.72
July	515,625.00	415,536.57	600,000	184,463.43
August	644,531.25	519,420.71	750,000	230,579.29
September	687,500.00	554,048.76	800,000	245,951.24
October	472,656.25	380,908.52	550,000	169,091.48
November	687,500.00	554,048.76	800,000	245,951.24
December	386,718.75	311,652.42	450,000	138,347.58
Total	4,296,875.00	3,462,814.71	5,000,000	1,537,185.29

X.—Quantity and Cost of Silver Used in the Coinage of Silver Dollars during the Calendar Year 1896, under Act of July 14, 1890—Cont'd.

MINT AT NEW ORLEANS.

Months.	Coined.		Dollars coined.	Seigniorage.
	Ounces, standard.	Cost.		
1896.				
January				
February	429,687.50	$332,064.64	500,000	$167,935.36
March	429,687.50	332,064.64	500,000	167,935.36
April	300,781.25	232,445.25	350,000	117,554.75
May	257,812.50	199,238.78	300,000	100,761.22
June	257,812.50	199,238.78	300,000	100,761.22
July	257,812.50	199,238.78	300,000	100,761.22
August	515,625.00	398,477.57	600,000	201,522.43
September	515,625.00	398,477.57	600,000	201,522.43
October	515,625.00	398,477.57	600,000	201,522.43
November	515,625.00	398,477.57	600,000	201,522.43
December	214,843.75	166,032.32	250,000	83,967.68
Total	4,210,937.50	3,254,233.47	4,900,000	1,645,766.53

RECAPITULATION.

January				
February	1,289,062.50	$1,031,374.66	1,500,000	$468,625.34
March	1,289,309.14	1,031,575.57	1,500,287	468,711.43
April	1,289,062.50	1,035,642.75	1,500,000	464,357.25
May	1,289,062.50	1,037,058.77	1,500,000	462,941.23
June	1,289,169.92	1,037,146.27	1,500,125	462,978.73
July	912,656.25	728,184.66	1,062,000	333,815.34
August	2,277,343.75	1,827,972.97	2,650,000	822,027.03
September	2,320,398.44	1,862,671.03	2,700,100	837,428.97
October	2,019,531.25	1,619,455.03	2,350,000	730,544.97
November	1,644,843.75	1,312,355.86	1,914,000	601,644.14
December	1,461,152.34	1,177,917.20	1,700,250	522,332.80
Total	17,081,592.34	13,701,354.77	19,876,762	6,175,407.23

XI.—Nominal Value of Materials Used in the Subsidiary Silver Coinage during the Calendar Year 1896.

Sources from which bullion was obtained.	Ounces fine.	Cost.	Coinage.
MINT AT PHILADELPHIA.			
Worn and uncurrent coin	1,709,877.45	$2,363,749.70	$1,300,000.00
Partings, charges, and fractions purchased	106,642.45	71,094.99	334,147.70
Melted assay coins purchased	610.27	806.20	
Mutilated coins purchased	1,391.70	927.80	
Surplus bullion purchased	1,442.87	964.74	
Total	1,819,964.74	2,437,543.43	1,644,147.70
MINT AT SAN FRANCISCO.			
Worn and uncurrent coin	682,087.66	942,924.00	674,989.35
Partings, charges, and fractions purchased	41,423.93	27,615.96	
Mutilated coins purchased	178.92	119.28	
Surplus bullion purchased	3,654.95	2,406.65	
Total	727,345.46	973,065.89	674,989.35
MINT AT NEW ORLEANS.			
Worn and uncurrent coin	719,351.55	994,437.95	894,000.00
Partings, charges, and fractions purchased	3,789.69	2,526.41	
Mutilated coins purchased	580.23	386.82	
Total	723,721.47	997,351.18	894,000.00
MINT AT CARSON.			
Partings, charges, and fractions purchased	1,574.26	1,049.51	
Surplus bullion purchased	30.17	19.75	
Total	1,604.43	1,069.26	
SUMMARY.			
Worn and uncurrent coin	3,111,316.66	4,301,111.65	2,878,989.35
Partings, charges, and fractions purchased	153,430.33	102,286.87	334,147.70
Melted assay coins purchased	610.27	806.20	
Mutilated coins purchased	2,150.85	1,433.90	
Surplus bullion purchased	5,127.99	3,391.14	
Total	3,272,636.10	4,409,029.76	3,213,137.05

XII.—STATEMENT SHOWING THE AMOUNT AND COST OF SILVER BULLION PURCHASED UNDER ACT OF JULY 14, 1890, AND USED IN THE COINAGE OF STANDARD SILVER DOLLARS, WASTED AND SOLD IN SWEEPS, NUMBER OF DOLLARS COINED AND SEIGNIORAGE ON THE SAME, FROM AUGUST 13, 1890, TO JANUARY 1, 1897.

Disposition.	Fine ounces.	Cost.
Total amount purchased and cost	168,674,682.53	$155,931,002.25
Used in coinage to January 1, 1897	46,345,245.90	45,493,114.13
Wasted and sold in sweeps	63,570.37	62,535.64
Total amount used	46,408,816.27	45,555,649.77
Balance on hand January 1, 1897	122,265,866.26	110,375,352.48
Total	168,674,682.53	155,931,002.25

Silver dollars coined	59,921,126
Seigniorage on same	$14,428,011.87

XIII.—SILVER FOR SUBSIDIARY

Stock.	PHILADELPHIA.		SAN FRANCISCO.	
	Ounces fine.	Cost.	Ounces fine.	Cost.
Silver bullion on hand Jan. 1, 1896	105,015.17	$70,040.04	6,087.96	$3,871.70
Uncurrent coins transferred from Treasury	1,709,877.45	2,363,749.70	682,087.66	942,924.00
Partings, charges, and fractions purchased	106,642.45	71,094.99	41,423.93	27,615.96
Melted assay coins purchased	610.27	806.20		
Mutilated coins purchased	1,391.70	927.80	178,92	119.28
Surplus bullion purchased	1,442.87	964.74	3,654.95	2,406.65
Total	1,924,979.91	2,507,583.47	733,433.42	976,937.59
Used in coinage, calendar year 1896	1,189,335.35	1,602,949.49	488,270.42	674,989.35
Transferred				
Sold in sweeps	2,713.02	1,814.00	1,794.34	1,181.51
Wasted by operative officers	1,912.18	1,278.53	477.90	314.68
Balance on hand Jan. 1, 1897	731,019.36	901,541.45	242,890.76	300,452.05
Total	1,924,979.91	2,507,583.47	733,433.42	976,937.59

COINAGE, CALENDER YEAR 1896.

NEW ORLEANS.		CARSON.		SUMMARY.	
Ounces fine.	Cost.	Ounces fine.	Cost.	Ounces fine.	Cost.
6,008.40	$7,786.34	3,642.31	$2,197.55	120,753.84	$83,895.63
719,351.55	994,437.95	.....	.....	3,111,316.66	4,301,111.65
3,789.69	2,526.41	1,574.26	1,049.51	153,430.33	102,286.87
.....	.....	.....	.....	610.27	806.20
580.23	386.82	.....	.....	2,150.85	1,433.90
.....	.....	30.17	19.75	5,127.99	3,391.14
729,729.87	1,005,137.52	5,246.74	3,266.81	3,393,389.94	4,492,925.39
646,697.25	894,000.00	.....	.....	2,324,303.02	3,171,938.84
.....	.....	2.16	1.73	2.16	1.73
2,480.84	1,651.82	.....	.....	6,988.20	4,647.33
1,904.16	1,268.76	.....	.....	4,294.24	2,861.97
78,647.62	108,216.94	5,244.58	3,265.08	1,057,802.32	1,313,475.52
729,729.87	1,005,137.52	5,246.74	3,266.81	3,393,389.94	4,492,925.39

XIV.—Coinage Executed at the Mints of the United

Denomination.	PHILADELPHIA.	
	Pieces.	Value.
GOLD.		
Double eagles	792,663	$15,853,260.00
Eagles	76,348	763,480.00
Half eagles	59,063	295,315.00
Quarter eagles	19,202	48,005.00
Total gold	947,276	16,960,060.00
SILVER.		
Dollars, act July 14, 1890	9,976,762	9,976,672.00
Subsidiary:		
Half dollars	950,762	475,381.00
Quarter dollars	3,874,762	968,690.50
Dimes	2,000,762	200,076.20
Total subsidiary	6,826,286	1,644,147.70
Total silver	16,803,048	11,620,939.70
MINOR.		
Five-cent nickels	8,842,920	442,146.00
One-cent bronze	39,057,293	390,572.93
Total minor	47,900,213	832,718.93
Total coinage	65,650,537	29,413,688.63

Coinage of silver dollars under act of—

February 28, 1878	$378,166,793
July 14, 1890	59,921,126
March 3, 1891	5,078,472
Total	443,166,391

STATES DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

SAN FRANCISCO.		NEW ORLEANS.		TOTAL.	
Pieces.	Value.	Pieces.	Value.	Pieces.	Value.
1,403,925	$28,078,500.00	.....	.....	2,196,588	$43,931,760.00
123,750	1,237,500.00	.....	.....	200,098	2,000,980.00
155,400	777,000.00	.....	.....	214,463	1,072,315.00
.....	.....	.....	.....	19,202	48,005.00
1,683,075	30,093,000.00	.....	.....	2,630,351	47,053,060.00
5,000,000	5,000,000.00	4,900,000	$4,900,000.00	19,876,762	19,876,762.00
1,140,948	570,474.00	924,000	462,000.00	3,015,710	1,507,855.00
188,039	47,009.75	1,484,000	371,000.00	5,546,801	1,386,700.25
575,056	57,505.60	610,000	61,000.00	3,185,818	318,581.80
1,904,043	674,989.35	3,018,000	894,000.00	11,748,329	3,213,137.05
6,904,043	5,674,989.35	7,918,000	5,794,000.00	31,625,091	23,089,899.05
.....	.....	.....	.....	8,842,920	442,146.00
.....	.....	.....	.....	39,057,293	390,572.93
.....	.....	.....	.....	47,900,213	832,718.93
8,587,118	35,767,989.35	7,918,000	5,794,000.00	82,155,655	70,975,677.98

XV.—Assets and Liabilities of the United States

ASSETS.

Institutions.	GOLD BULLION.		SILVER BULLION.		Value of bullion shipped for coinage.
	Standard ounces.	Value.	Standard ounces.	Value (cost).	
COINAGE MINTS.					
Philadelphia	1,014,925.456	$18,882,334.00	124,346,173.77	$101,533,734.80	.....
San Francisco	141,713.837	2,636,536.41	7,051,269.13	6,571,389.84	.....
New Orleans	22,934.138	426,681.90	3,992,247.93	3,125,913.47	.....
Carson	14,379.860	267,532.18	636,917.83	457,976.03	.....
ASSAY OEFICES.					
New York	1,733,436.712	32.249.985.20	640,308.44	573,882.57	.....
Denver	4.146.511	77,144.38	981.63	588.98	$202,301.19
Helena	1,981.152	36,858.63	337.60	202.56	22,504.55
Boise	2,349.942	43,719.85	612.41	367.45	.....
Charlotte	1,043.229	19,408.92	203.76	122.26	.....
St. Louis	459.109	8,541.54	80.48	48.29	.....
Total	2,937,369.946	54,648,743.01	136,669,132.98	112,264,226.25	224,805.74

LIABILITIES.

Institutions.	Bullion fund.	Undeposited earnings.
COINAGE MINTS.		
Philadelphia	$191,551,414.96	.....
San Francisco	51,968,502.81	.....
New Orleans	18,525,076.05	.....
Carson	5,974,130.10	$0.63
ASSAY OFFICES.		
New York	37,227,628.59	5,261.01
Denver	513,338.17	1,956.76
Helena	239,558.14	1,553.82
Boise	123,955.54	470.61
Charlotte	44,449.12	230.28
St. Louis	33,472.45	173.48
Total	306 201,525.93	9 646.59

MINTS AND ASSAY OFFICES, DECEMBER 31, 1896.

ASSETS.

Gold coin.	Silver coin.	Credit balances with assistant treasurers and depository banks.	Minor coin.	Minor coinage metal.	Deficiencies.	Total.
$6,362,872.50	$65,283,838.44	.....	$86,446.76	$76,389.53	$13,543.82	$192,239,159.85
1,211,945.00	41,355,763.65	.....	.....	.....	413,557.96	52,189,192.86
1,087,060.00	13,944,462.15	.....	.....	.....	25,000.00	18,609,117.52
1,554.90	5,121,296.02	*a* $50,221.85	.....	.....	75,549.75	5,974,130.73
8,935.00	1,987.61	*b* 4,444,568.40	.....	.....	.....	37,279,358.78
.....	.....	235,260.38	.....	.....	.....	515,294.93
.....	.....	181,546.22	.....	.....	.....	241,111.96
.....	.....	80,338.85	.....	.....	.....	124,426.15
.....	.....	25,148.22	.....	.....	.....	44,679.40
.....	.....	25,056.10	.....	.....	.....	33,645.93
8,672,367.40	125,707,347.87	5,042,140.02	86,446.76	76,389.53	527,651.53	307,250,118.11

a Gold coin. *b* Gold coin, $4,427,972.73; silver coin, $16,595.67.

LIABILITIES.

Seigniorage on silver.	Unpaid depositors.	Minor coinage profits.	Minor coin metal fund.	Unpaid cent depositors and subtreasury transfers.	Total.
$300,171.04	$224,737.56	$42,334.09	$37,000.00	$83,502.20	$192,239,159.85
138,347.58	82,342.47	.....	.....	.....	52,189,192.86
83,967.68	73.79	.....	.....	.....	18,609,117.52
.....	.....	.....	.....	.....	5,974,130.73
.....	46,469.18	.....	.....	.....	37,279,358.78
.....	.....	.....	.....	.....	515,294.93
.....	.....	.....	.....	.....	241,111.96
.....	.....	.....	.....	.....	124,426.15
.....	.....	.....	.....	.....	44,679.40
.....	.....	.....	.....	.....	33,645.93
522,486.30	353,623.00	42,334.09	37,000.00	83,502.20	307,250,118.11

XVI.—UNREFINED GOLD AND SILVER OF DOMESTIC PRODUCTION, BY VALUE, ITS DISTRIBUTION, BY STATES AND TERRITORIES; ALSO REFINED DOMESTIC BULLION (NOT DISTRIBUTED) DEPOSITED AT THE MINTS AND ASSAY OFFICES FROM THEIR ORGANIZATION TO THE CLOSE OF THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

Localities.	Gold.	Silver.	Total.
Alabama	$253,473.46	$367.87	$253,841.33
Alaska	2,431,365.35	26,978.07	2,458,343.42
Arizona	8,414,329.19	14,109,658.05	22,523,987.24
California	773,798,420.48	4,339,503.70	778,137,924.18
Connecticut	125.82	.....	125.82
Colorado	73,741,304.80	24,950,906.01	98,692,210.81
Georgia	9,475,320.07	8,072.92	9,483,392.99
Idaho	37,401,485.05	1,997,368.26	39,398,853.31
Iowa	1,086.84	5.97	1,092.81
Maine	6,311.06	22.90	6,333.96
Maryland	17,910.73	41.35	17,952.08
Michigan	484,430.03	4,151,464.78	4,635,894.81
Minnesota	5,927.23	78.39	6,005.62
Missouri	96.71	359.11	455.82
Montana	77,397,582.44	22,190,429.00	99,588,011,44
Nebraska	2,340.26	273,226.13	275,566.39
Nevada	36,680,007.09	104,673,015.03	141,353,022.12
New Hampshire	481.34	1.75	483.09
New Mexico	6,514,471.98	7,114,296.16	13,628,768.14
North Carolina	11,871,692.74	67,541.09	11,939,233.83
Oregon	23,262,422.01	109,797.46	23,372,219.47
South Carolina	2,511,159.32	4,824.42	2,515,983.74
South Dakota	57,886,519.34	1,143,921.17	59,030,440.51
Tennessee	91,417.08	16.33	91,433.41
Texas	8,841.20	3,454.53	12,295.73
Utah	1,827,332.71	19,935,803.73	21,763,136.44
Vermont	79,637.38	91.89	79,729.27
Virginia	1,767,244.21	467.77	1,767,711.98
Washington	1,300,779.90	18,463.38	1,319,243.28
Wisconsin	325.73	7.02	332.75
Wyoming	889,872.87	13,408.63	903,281.50
Other sources	42,147,162.13	42,961,692.97	85,108,855.10
Total unrefined	1,170,270,876.55	248,095,285.84	1,418,366,162.39
Refined	524,937,054.63	538,876,410.17	1,063,813,464.80
Total	1,695,207,931.18	786,971,696.01	2,482,179,627.19

XVII.—PRODUCT OF GOLD AND SILVER IN THE UNITED STATES FROM 1792 TO 1844, AND ANNUALLY SINCE.

[The estimate for 1792–1873 is by R. W. Raymond, commissioner, and since by Director of the Mint.]

Years.	Gold.	Silver.	Total.
April 2, 1792–July 31, 1834	$14,000,000	Insignificant.	$14,000,000
July 31, 1834–December 31, 1844	7,500,000	$250,000	7,750,000
1845	1,008,327	50,000	1,058,327
1846	1,139,357	50,000	1,189,357
1847	889,085	50,000	939,085
1848	10,000,000	50,000	10,050,000
1849	40,000,000	50,000	40,050,000
1850	50,000,000	50,000	50,050,000
1851	55,000,000	50,000	55,050,000
1852	60,000,000	50,000	60,050,000
1853	65,000,000	50,000	65,050,000
1854	60,000,000	50,000	60,050,000
1855	55,000,000	50,000	55,050,000
1856	55,000,000	50,000	55,050,000
1857	55,000,000	50,000	55,050,000
1858	50,000,000	500,000	50,500,000
1859	50,000,000	100,000	50,100,000
1860	46,000,000	150,000	46,150,000
1861	43,000,000	2,000,000	45,000,000
1862	39,200,000	4,500,000	43,700,000
1863	40,000,000	8,500,000	48,500,000
1864	46,100,000	11,000,000	57,100,000
1865	53,225,000	11,250,000	64,475,000
1866	53,500,000	10,000,000	63,500,000
1867	51,725,000	13,500,000	65,225,000
1868	48,000,000	12,000,000	60,000,000
1869	49,500,000	12,000,000	61,500,000
1870	50,000,000	16,000,000	66,000,000
1871	43,500,000	23,000,000	66,500,000
1872	36,000,000	28,750,000	64,750,000
1873	36,000,000	35,750,000	71,750,000
1874	33,500,000	37,300,000	70,800,000
1875	33,400,000	31,700,000	65,100,000
1876	39,900,000	38,800,000	78,700,000
1877	46,900,000	39,800,000	86,700,000
1878	51,200,000	45,200,000	96,400,000
1879	38,900,000	40,800,000	79,700,000
1880	36,000,000	39,200,000	75,200,000
1881	34,700,000	43,000,000	77,700,000
1882	32,500,000	46,800,000	79,300,000
1883	30,000,000	46,200,000	76,200,000
1884	30,800,000	48,800,000	79,600,000
1885	31,800,000	51,600,000	83,400,000
1886	35,000,000	51,000,000	86,000,000
1887	33,000,000	53,350,000	86,350,000
1888	33,175,000	59,195,000	92,370,000
1889	32,800,000	64,646,000	97,446,000
1890	32,845,000	70,465,000	103,310,000
1891	33,175,000	75,417,000	108,592,000
1892	33,000,000	82,101,000	115,101,000
1893	35,955,000	77,576,000	113,531,000

XVII.—PRODUCT OF GOLD AND SILVER IN THE UNITED STATES FROM 1792 TO 1844, AND ANNUALLY SINCE—Continued.

Years.	Gold.	Silver.	Total.
1894	39,500,000	64,000,000	103,500,000
1895	46,610,000	72,051,000	118,661,000
1896	53,088,000	76,069,000	129,157,000
Total	2,113,034,769	1,444,970,000	3,558,004,769

XVIII.—PRECIOUS METALS PRODUCT, UNITED STATES AND MEXICO.

WELLS, FARGO & COMPANY,
San Francisco, December 31, 1896.

DEAR SIR: The following is our annual report of precious metals produced in the States and Territories west of the Missouri River (including British Columbia) during 1896, which shows in the aggregate: Gold, $54,399,242; silver, $35,784,963; copper, $28,869,305; lead, $7,236,026; total gross result, $126,289,536. The "commercial" value at which the several metals named herein have been estimated is: Silver, 67 cents per ounce; copper, 11 cents per pound; and lead, $3 per hundredweight.

Allowance must always be made for probable variations from reported figures, by reason of constantly increasing facilities for transporting bullion, ores, and base metals from the mines outside of the express, and the difficulty of getting entirely reliable data from private sources. Estimates obtained in this way are liable to be exaggerated, and are, to a considerable degree, guesswork; but with some modifications on this account, made herein, the general results reached, while only approximately correct, may be accepted as the closest approximation possible under the circumstances.

States and Territories.	Gold dust and bullion by express.	Gold dust and bullion by other conveyances.	Silver bullion by express.	Ores and base bullion by freight.	Total.
California	$11,553,928	$3,973,376	$83,839	$20,248	$15,631,391
Nevada	1,081,656	950,000	478,814	248,894	2,759,364
Oregon	1,746,752	203,452	96,784	25,000	2,071,988
Washington	345,850	37,500	170,500	.....	553,850
Alaska	.....	2,715,955	.....	35,000	2,750,955
Idaho	2,652,500	.....	3,272,682	2,200,000	8,125,182
Montana	4,625,000	.....	9,350,000	23,295,500	37,270,500
Utah	777,698	1,163,122	1,050,348	7,392,591	10,383,759
Colorado	12,712,483	.....	12,185,881	1,956,480	26,854,844
New Mexico	245,115	544,200	179,876	177,600	1,146,791
Arizona	1,313,510	1,775,880	293,618	5,882,909	9,265,917
Dakota	4,572,265	.....	185,000	37,500	4,794,765
Texas	.....	.....	311,730	.....	311,730
Wyoming	25,000	.....	3,500	.....	28,500
British Columbia (entire Province)	1,384,000	.....	2,100,000	856,000	4,340,000
Total	43,035,757	11,363,485	29,762,572	42,127,722	126,289,536

The gross yield for 1896, shown above, segregated, is approximately as follows:

Metal.	Per cent of total.	Total value.
Gold	$43\frac{7}{100}$	$54,399,242
Silver	$28\frac{34}{100}$	35,784,963
Copper	$22\frac{86}{100}$	28,869,305
Lead	$5\frac{73}{100}$	7,236,026
Total	.....	126,289,536

ANNUAL PRODUCTS OF LEAD, COPPER, SILVER, AND GOLD IN THE STATES AND TERRITORIES WEST OF THE MISSOURI RIVER, 1870–1896.

Year.	Production as per W. F. & Co.'s statements, including amounts from British Columbia and west coast of Mexico.	Product after deducting amounts from British Columbia and west coast of Mexico.	The net products of the States and Territories west of the Missouri River, exclusive of British Columbia and west coast of Mexico, divided, are as follows:			
			Lead.	Copper.	Silver.	Gold.
1870	$54,000,000	$52,150,000	$1,080,000	.....	$17,320,000	$33,750,000
1871	58,284,000	55,784,000	2,100,000	.....	19,286,000	34,398,000
1872	62,236,959	60,351,824	2,250,000	.....	19,924,429	38,177,395
1873	72,258,693	70,139,860	3,450,000	.....	27,483,302	39,206,558
1874	74,401,045	71,965,610	3,800,000	.....	29,699,122	38,466,488
1875	80,889,057	76,703,433	5,100,000	.....	31,635,239	39,968,194
1876	90,875,173	87,219,859	5,040,000	.....	39,292,924	42,886,935
1877	98,421,754	95,811,582	5,085,250	.....	45,846,109	44,880,223
1878	81,154,622	78,276,167	3,452,000	.....	37,248,137	37,576,030
1879	75,349,501	72,688,888	4,185,769	.....	37,032,857	31,470,262
1880	80,167,936	77,232,512	5,742,390	$898,000	38,033,055	32,559,067
1881	84,504,417	81,198,474	6,361,902	1,195,000	42,987,613	30,653,959
1882	92,411,835	89,207,549	8,008,155	4,055,037	48,133,039	29,011,318
1883	90,313,612	84,639,212	8,163,550	5,683,921	42,975,101	27,816,640
1884	84,975,954	81,633,835	6,834,091	6,086,252	43,529,925	25,183,567
1885	90,181,260	87,311,382	8,562,991	7,838,036	44,516,599	26,393,756
1886	103,011,761	100,160,222	9,185,192	9,276,755	52,136,851	29,561,424
1887	104,645,959	103,327,770	9,631,073	10,362,746	50,833,884	32,500,067
1888	114,341,592	112,665,569	11,263,630	18,261,490	53,152,747	29,987,702
1889	127,677,836	126,723,384	14,593,323	14,793,763	64,808,637	32,527,661
1890	127,166,410	126,804,855	11,509,571	20,569,092	62,930,831	31,795,361
1891	118,237,441	117,946,565	12,385,780	13,261,663	60,614,004	31,685,118
1892	111,531,700	111,259,508	11,433,947	19,370,516	50,607,601	29,847,444
1893	104,081,591	103,827,623	7,756,040	23,631,339	38,491,521	33,948,723
1894	105,113,489	104,844,112	8,223,513	22,276,294	28,721,014	45,623,291
1895	118,164,642	117,896,988	7,170,367	27,052,115	35,274,777	48,399,729
1896	126,289,536	121,949,536	6,536,026	28,713,305	33,684,963	53,015,242

The exports of silver during the past year to Japan, China, the Straits, etc., have been as follows: From London, $33,968,620; from San Francisco, $9,947,776. Total, $43,916,396, as against $43,956,787 last year. Pounds sterling estimated at $4.84.

STATEMENT OF THE PRODUCT OF GOLD AND SILVER IN THE REPUBLIC OF MEXICO, REVISED AND CORRECTED FROM 1877 TO 1896—VALUES UPON MINTAGE BASIS.

Years.	Gold.	Silver.	Total.
1877–1878	$747,000	$24,837,000	$25,584,000
1878–1879	881,000	25,125,000	26,006,000
1879–1880	942,000	26,800,000	27,742,000
1880–1881	1,013,000	29,234,000	30,247,000
1881–1882	937,000	29,329,000	30,266,000
1882–1883	956,000	29,569,000	30,525,000
1883–1884	1,055,000	31,695,000	32,750,000
1884–1885	914,000	33,226,000	34,140,000
1885–1886	1,026,000	34,112,000	35,138,000
1886–1887	1,047,000	34,600,000	35,647,000
1887–1888	1,031,000	34,912,000	35,943,000
1888–1889	1,040,000	40,706,000	41,746,000
1889–1890	1,100,000	41,500,000	42,600,000
1890–1891	1,150,000	43,000,000	44,150,000
1891–1892	1,275,000	45,750,000	47,025,000
1892–1893	1,400,000	48,500,000	49,900,000
1893–1894	1,425,000	47,250,000	48,675,000
1894–1895	4,750,000	54,225,000	58,975,000
1895–1896	5,475,000	54,450,000	59,925,000
Total	28,164,000	708,820,000	736,984,000

EXHIBIT OF COINAGE OF GOLD, SILVER, AND COPPER, IN THE REPUBLIC OF MEXICO, FROM THE 1ST OF JULY, 1873, TO THE 30TH OF JUNE, 1896.

Years.	Gold.	Silver.	Copper.
1873–1874	$866,743	$18,846,067	$15,966
1874–1875	862,619	19,386,958	21,712
1875–1876	809,401	19,454,054	30,654
1876–1877	695,750	21,415,128	9,035
1877–1878	691,998	22,084,203	41,364
1878–1879	658,206	22,162,987	16,300
1879–1880	521,826	24,018,528	14,035
1880–1881	492,068	24,617,395	42,258
1881–1882	452,590	25,146,260	11,972
1882–1883	407,600	24,083,921	.....
1883–1884	328,698	25,377,379	.....
1884–1885	423,250	25,840,728	.....
1885–1886	425,000	25,850,000	.....
1886–1887	410,000	25,600,000	.....
1887–1888	340,320	26,711,000	.....
1888–1889	305,100	25,274,500	.....
1889–1890	243,298	24,328,326	.....
1890–1891	308,000	24,238,000	.....
1891–1892	291,940	25,527,000	.....
1892–1893	361,672	27,169,876	.....
1893–1894	553,978	30,185,611	.....
1894–1895	545,237	27,628,981	.....
1895–1896	565,786	22,634,788	.....
Total	11,561,080	557,581,690	203,296

SUMMARY.—Totals: Gold, $11,561,080; silver, $557,581,690; copper, $203,296. Grand total, $569,346,066.

EXHIBIT OF THE COINAGE OF MEXICO FROM THE ESTABLISHMENT OF THE MINTS IN 1537 TO THE END OF THE FISCAL YEAR OF 1896.

	Gold.	Silver.	Copper.	Total.
COLONIAL EPOCH.				
Unmilled coin from 1537 to 1731	$8,497,950	$752,067,456	$200,000	$760,765,406
Pillar coin 1732 to 1771	19,889,014	441,629,211	.....	461,518,225
Bust coin 1772 to 1821	40,391,447	888,563,989	342,893	929,298,329
INDEPENDENCE.	68,778,411	2,082,260,656	542,893	2,151,581,960
Iturbide's imperial bust, from 1822 to 1823	557,392	18,575,569	.....	19,132,961
Republic eagle—1824 to 30th June, 1873	45,040,628	740,246,485	5,235,177	790,522,290
REPUBLIC.	45,598,020	758,822,054	5,235,177	809,655,251
Eagle coin, from 1st July, 1873, to 30th of June, 1896	11,561,080	557,581,690	203,296	569,346,066

SUMMARY.—Colonial epoch, from 1537 to 1821, $2,151,581,960; Independence, from 1822 to 1873, $809,655,251; Republic, from 1873 to 1896, $569,346,066. Total, $3,530,583,277.

JNO. J. VALENTINE, *President.*

XIX.—HIGHEST, LOWEST, AND AVERAGE PRICE OF BAR SILVER IN LONDON PER OUNCE BRITISH STANDARD (0.925), SINCE 1833, AND THE EQUIVALENT IN UNITED STATES GOLD COIN OF AN OUNCE 1,000 FINE, TAKEN AT THE AVERAGE PRICE.

Calendar years.	Lowest quotation.	Highest quotation.	Average quotation.	Value of a fine ounce at average quotation.	Calendar years.	Lowest quotation.	Highest quotation.	Average quotation.	Value of a fine ounce at average quotation.
	d.	*d.*	*d.*	*Dollars.*		*d.*	*d.*	*d.*	*Dollars.*
1833	58¾	59⅞	59 3/16	1.297	1866	60⅜	62¼	61⅛	1.339
1834	59¾	60¾	59 15/16	1.313	1867	60⅜	61¼	60 9/16	1.328
1835	59¼	60	59 11/16	1.308	1868	60⅛	61⅛	60½	1.326
1836	59⅝	60⅜	60	1.315	1869	60	61	60 7/16	1.325
1837	59	60⅜	59 9/16	1.305	1870	60¼	60¾	60 9/16	1.328
1838	59½	60⅛	59½	1.304	1871	60 3/16	61	60½	1.326
1839	60	60⅝	60⅜	1.323	1872	59¼	61⅛	60 5/16	1.322
1840	60⅓	60¾	60⅜	1.323	1873	57⅞	59 15/16	59¼	1.298
1841	59¾	60⅜	60 1/16	1.316	1874	57¼	59½	58 5/16	1.278
1842	59¼	60	59 7/16	1.303	1875	55½	57⅝	56⅞	1.246
1843	59	59⅝	59 3/16	1.297	1876	46¾	58½	52¾	1.156
1844	59¼	59¾	59½	1.304	1877	53¼	58¼	54 13/16	1.201
1845	58⅞	59⅞	59¼	1.298	1878	49½	55¼	52 9/16	1.152
1846	59	60⅓	59 5/16	1.309	1879	48⅞	53¾	51¼	1.123
1847	58⅞	60⅜	59 11/16	1.308	1880	51⅝	52⅞	52¼	1.145
1848	58½	60	59½	1.304	1881	50⅞	52⅞	51 15/16	1.138
1849	59½	60	59¾	1.309	1882	50	52⅜	51 13/16	1.136
1850	59½	61½	61 1/16	1.316	1883	50	51 3/16	50⅝	1.110
1851	60	61⅝	61	1.337	1884	49½	51⅜	50¾	1.113
1852	59⅞	61⅞	60½	1.326	1885	46⅞	50	48 9/16	1.0645
1853	60⅝	61⅞	61½	1.348	1886	42	47	45⅜	.9946
1854	60⅞	61⅞	61½	1.348	1887	43¼	47⅛	44⅝	.97823
1855	60	61⅝	61 5/16	1.344	1888	41⅝	44 9/16	42⅞	.93974
1856	60½	62¼	61 5/16	1.344	1889	42	44⅜	41 11/16	.93512
1857	61	62⅜	61¾	1.353	1890	43⅝	54⅝	47¾	1.04633
1858	60¾	61⅞	61 5/16	1.344	1891	43½	48¾	45 1/16	.98782
1859	61¾	62¾	62 1/16	1.360	1892	37⅞	43¾	39¾	.87105
1860	61¼	62⅜	61 11/16	1.352	1893	30½	38¾	35 7/16	.78031
1861	60⅛	61⅜	60 13/16	1.333	1894	27	31¾	28⅞	.63479
1862	61	62⅛	61 7/16	1.346	1895	27 7/16	31⅜	29⅞	.65406
1863	61	61¾	61⅜	1.345	1896	29¾	31 15/16	30¾	.67437
1864	60⅝	62½	61⅜	1.345	1897 (9 mos.)	23⅝	29 13/16	27¾	.60953
1865	60½	61⅝	61 1/16	1.338					

XX.—Commercial Ratio of Silver to Gold each Year since 1687.

[Note.—From 1687 to 1832 the ratios are taken from Dr. A. Soetbeer; from 1833 to 1878 from Pixley and Abell's tables; and from 1879 to 1896 from daily cablegrams from London to the Bureau of the Mint.]

Years.	Ratio.	Years.	Ratio.	Years.	Ratio.	Years.	Ratio.	Years.	Ratio.	Years.	Ratio.
1687....	14.94	1723...	15.20	1758...	14.85	1793...	15.00	1828...	15.78	1863...	15.37
1688....	14.94	1724...	15.11	1759...	14.15	1794...	15.37	1829...	15.78	1864...	15.37
1689....	15.02	1725...	15.11	1760...	14.14	1795...	15.55	1830...	15.82	1865...	15.44
1690....	15.02	1726...	15.15	1761...	14.54	1796...	15.65	1831...	15.72	1866...	15.43
1691....	14.98	1727...	15.24	1762...	15.27	1797...	15.41	1832...	15.73	1867...	15.57
1692....	14.92	1728...	15.11	1763...	14.99	1798 ..	15.59	1833...	15.93	1868...	15.59
1693....	14.83	1729...	14.92	1764...	14.70	1799...	15.74	1834...	15.73	1869...	15.60
1694....	14.87	1730...	14.81	1765...	14.83	1800...	15.68	1835...	15.80	1870...	15.57
1695....	15.02	1731...	14.94	1766...	14.80	1801...	15.46	1836...	15.72	1871...	15.57
1696....	15.00	1732...	15.09	1767...	14.85	1802...	15.26	1837...	15.83	1872...	15.63
1697....	15.20	1733...	15.18	1768...	14.80	1803...	15.41	1838...	15.85	1873...	15.92
1698....	15.07	1734...	15.39	1769...	14.72	1804...	15.41	1839...	15.62	1874...	16.17
1699....	14.94	1735...	15.41	1770...	14.62	1805...	15.79	1840...	15.62	1875...	16.59
1700....	14.81	1736...	15.18	1771...	14.66	1806...	15.52	1841...	15.70	1876...	17.88
1701....	15.07	1737...	15.02	1772...	14.52	1807...	15.43	1842...	15.87	1877...	17.22
1702....	15.52	1738...	14.91	1773...	14.62	1808...	16.08	1843...	15.93	1878...	17.94
1703....	15.17	1739...	14.91	1774...	14.62	1809...	15.96	1844...	15.85	1879...	18.40
1704....	15.22	1740..	14.94	1775...	14.72	1810...	15.77	1845...	15.92	1880...	18.05
1705....	15.11	1741...	14.92	1776...	14.55	1811...	15.53	1846...	15.90	1881...	18.16
1706....	15.27	1742...	14.85	1777...	14.54	1812...	16.11	1847...	15.80	1882...	18.19
1707....	15.44	1743...	14.85	1778...	14.68	1813...	16.25	1848...	15.85	1883...	18.64
1708....	15.41	1744...	14.87	1779...	14.80	1814...	15.04	1849...	15.78	1884...	18.57
1709....	15.31	1745...	14.98	1780...	14.72	1815...	15.26	1850...	15.70	1885...	19.41
1710....	15.22	1746...	15.13	1781...	14.78	1816...	15.28	1851...	15.46	1886...	20.78
1711....	15.29	1747...	15.26	1782...	14.42	1817...	15.11	1852...	15.59	1887...	21.13
1712....	15.31	1748...	15.11	1783...	14.48	1818...	15.35	1853...	15.33	1888...	21.99
1713....	15.24	1749...	14.80	1784...	14.70	1819...	15.33	1854...	15.33	1889...	22.10
1714....	15.13	1750...	14.55	1785...	14.92	1820...	15.62	1855...	15.38	1890...	19.76
1715....	15.11	1751...	14.39	1786...	14.96	1821...	15.95	1856...	15.38	1891...	20.92
1716....	15.09	1752...	14.54	1787...	14.92	1822...	15.80	1857...	15.27	1892...	23.72
1717....	15.13	1753...	14.54	1788...	14.65	1823...	15.84	1858...	15.38	1893...	26.49
1718....	15.11	1754...	14.48	1789...	14.75	1824...	15.82	1859...	15.19	1894...	32.56
1719....	15.09	1755...	14.68	1790...	15.04	1825...	15.70	1860...	15.29	1895...	31.60
1720....	15.04	1756...	14.94	1791...	15.05	1826...	15.76	1861...	15.50	1896...	30.66
1721....	15.05	1757...	14.87	1792...	15.17	1827...	15.74	1862...	15.35	1897*a*.	32.29
1722....	15.17										

a Nine months.

XXI.—IMPORTS INTO THE UNITED STATES OF GOLD AND SILVER ORE, BULLION, AND

Customs districts and ports.	GOLD.								Total.
	Contained in—			Gold ore.	Bullion.		Coin.		
	Copper regulus.	Base bullion.	Silver lead ore.		Ounces.	Value.	United States.	Foreign.	
Arizona		$125,765	$106,035	$173,896	60,409	$1,208,293			$1,613,989
Bangor				1,300	9,480	171,677	$72,211	$20,342	265,530
Brazos Santiago									
Boston and Charlestown					6,788	135,500	3,618,907		3,754,407
Cape Vincent									
Champlain					1,717	33,513	5,238,892	37,916	5,310,321
Corpus Christi		35,863	257		24,346	505,543	221,170		762,833
Detroit				45	6	50			95
Galveston		5,584							5,584
Kansas City	$11,652		983						12,635
Los Angeles				135			60	241	436
Mobile					334	5,812	203	747	6,762
Montana and Idaho									
New Orleans				26,869	6,025	103,341			130,210
New York		319,764		8,401	861,890	17,237,810	56,100,936	6,940,329	80,607,240
Niagara					4,973	99,450	200,000	61,557	361,007
Omaha									
Oswegatchie				600					600
Paso del Norte			296,619		36,475	773,559	290	35,802	1,106,270
Philadelphia								10,070	10,070
Pittsburg									
Puget Sound			744,183	59,244	500	10,000			813,427
Saluria		68,420	11,535				5,718		85,673
San Diego				3,753	7,725	127,678			131,431
San Francisco			35,036	37,975	45,583	980,117	197,711	8,449,492	9,700,331
Vermont							55,000		55,000
Total	11,652	555,396	1,194,648	312,218	1,066,251	21,392,343	65,711,098	15,556,496	104,733,851

COIN, BY CUSTOMS DISTRICTS, DURING CALENDAR YEAR ENDED DECEMBER 31, 1896.

SILVER.								
Contained in—			Silver ore.	Bullion.		Coin.		Total.
Copper regulus.	Base bullion.	Silver lead ore.		Ounces.	Value.	United States.	Foreign.	
.....	$589,865	$780,823	$52,848	957,673	$615,382	.....	.....	$2,038,918
.....	.....	.....	.....	.....	.....	$14,851	$400	15,251
.....	.....	.....	.....	.....	.....	.....	51,614	51,614
.....	.....	.....	.....	.....	.....	5,840	.....	5,840
.....	.....	.....	.....	.....	.....	200	.....	200
.....	.....	.....	.....	.....	.....	54,563	.....	54,563
.....	460,019	1,866	.....	168,586	112,341	.....	640,242	1,214,468
.....	.....	.....	.....	181	95	.....	.....	95
.....	60,310	.....	.....	.....	.....	.....	.....	60,310
$249,453	.....	117,683	.....	.....	.....	.....	.....	367,136
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	98	35,936	36,034
.....	.....	188,278	.....	.....	.....	.....	.....	188,278
.....	.....	.....	.....	.....	.....	110	435,464	435,574
.....	7,465,861	.....	423,259	1,393,046	810,734	70,837	1,356,037	10,126,728
.....	.....	.....	.....	.....	.....	14,200	.....	14,200
.....	.....	496,441	.....	.....	.....	.....	.....	496,441
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	3,019,268	.....	855,794	502,217	.....	4,583,003	8,104,488
.....	.....	.....	.....	.....	.....	.....	821	821
.....	1,835,670	.....	.....	.....	.....	.....	.....	1,835,670
.....	91,214	1,240,282	2,830	.....	.....	.....	1,910	1,336,236
.....	653,174	108,373	.....	.....	.....	83	276,635	1,038,265
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	524,483	.....	2,471,506	1,749,692	.....	487,412	2,761,587
.....	.....	.....	.....	.....	.....	.....	.....	.....
249,453	11,156,113	6,477,497	478,937	5,846,786	3,790,461	160,782	7,869,474	30,182,717

XXII.—IMPORTS INTO THE UNITED STATES OF GOLD AND SILVER ORE, BULLION,

Countries from which imported.	GOLD.								Total.
	Contained in—			Gold ore.	Bullion.		Coin.		
	Copper regulus.	Base bullion.	Silver lead ore.		Ounces.	Value.	United States.	Foreign.	
Azores, and Madeira Islands							$25,773	$973	$26,746
France					54,501	$1,090,021	17,519,496	96,741	18,706,258
Germany					3,340	66,803	3,487,900	119,000	3,673,703
United Kingdom				$507	772,230	15,444,601	35,573,630	451,833	51,470,571
Italy									
Norway and Sweden							3,461		3,461
British Honduras				12,459	148	2,880	203	649	16,191
Dominion of Canada:									
Nova Scotia, New Brunswick				1,300	16,268	307,177	72,211	20,342	401,030
Ontario, Quebec, etc				645	6,695	133,013	5,493,892	99,473	5,727,023
British Columbia	$11,652		$745,166	59,244	16,909	362,796			1,178,858
Central American States:									
Costa Rica				6,000	622	12,450	4,547		22,997
Honduras					7,795	155,988	3,386	1,893	161,267
Nicaragua				15,009	9,101	164,089	59,976	2,000	241,074
San Salvador					38	767	500		1,267
Guatemala					59	1,182	1,135	98	2,415
Mexico		$555,396	449,482	213,065	159,076	3,261,255	341,360	89,811	4,910,369
Miquelon, Langley, etc								1,200	1,200
British West Indies					116	2,314	183,440	21,314	207,068
Danish West Indies							36,714		36,714
Dutch West Indies					46	911	157,960	6,109	164,980
French West Indies					2	31	6,893	1,342	8,266
Santo Domingo					81	1,620	54,262	4,358	60,240
Haiti					201	4,011	562,563		566,574
Cuba							1,500,798	6,001,343	7,502,141
Puerto Rico					1	8	15,491	5,509	21,008
South American States:									
Colombia				170	17,199	343,975	96,895	25,449	466,489
Venezuela					125	2,500	396,622	83,859	482,981
Peru				991	375	7,501	6,000	19	14,511
Chile							894	73,677	74,571
Ecuador					53	1,057	487	12	1,556
Brazil					40	797			797
Dutch Guiana				70	618	12,362			12,432

AND COIN, BY COUNTRIES, DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

SILVER.								
Contained in—			Silver ore.	Bullion.		Coin.		Total.
Copper regulus.	Base bullion.	Silver lead ore.		Ounces.	Value.	United States.	Foreign.	
						$330		$330
				9,160	$6,176	437	$965	7,578
						6,420	4,046	10,466
			$45			6,736	6,974	13,755
						40		40
						68	2	70
						84	321,384	321,468
						15,319	400	15,719
				181	95	68,963		69,058
$249,453	$91,214	$1,990,178	2,830					2,333,675
							3,885	3,885
			548	893,345	494,330	76	104,691	599,645
						610	429,526	430,136
				16,394	11,058	351	46,828	58,237
							85,887	85,887
	11,064,899	4,478,669	52,848	4,912,659	3,268,848	995	6,005,741	24,872,000
							1,040	1,040
						4,691	25,955	30,646
						3,728	25,010	28,738
				90	50	2,973	16,669	19,692
						55	2	57
						1,186	248,833	250,019
						10,650	6,412	17,062
				1,100	695	1,853	61,401	63,949
						2,230	7,459	9,689
			13,706	13,717	9,124	26,788	428,362	477,980
						10	142	152
			400,176	5	3	50	31,124	431,353
			8,209					8,209
			575			166	916	1,657
				135	82			82

XXII.—IMPORTS INTO THE UNITED STATES OF GOLD AND

Countries from which imported.	GOLD.								Total.
	Contained in—			Gold ore.	Bullion.		Coin.		
	Copper regulus.	Base bullion.	Silver lead ore.		Ounces.	Value.	United States.	Foreign.	
Australasia	.....	.....	.....	$2,758	.....	.....	$5,890	$8,395,084	$8,403,732
Japan	.....	.....	.....	.....	.....	.....	98,719	54,408	153,127
China	.....	.....	.....	.....	.....	.....	.....	.....	.....
British Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gibraltar	.....	.....	.....	.....	.....	.....	.....	.....	.....
French Oceanica	.....	.....	.....	.....	.....	.....	.....	.....	.....
Madagascar	.....	.....	.....	.....	612	$12,234	.....	.....	12,234
Tonga, Samoa, etc	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	$11,652	$555,396	$1,194,648	312,218	1,066,251	21,392,343	65,711,098	15,556,496	104,733,851

XXIII—EXPORTS OF DOMESTIC GOLD AND SILVER ORE, BULLION, AND COIN DAR YEAR ENDED

Customs districts.	GOLD.								
	Base bullion.	Ore.	Total.	U. S. Mint or assay office bars.		Other bars.		Coin.	Total.
	Value.	Value.	Value.	Ounces.	Value.	Ounces.	Value.	Value.	Value.
Baltimore	.....	$1,563	$1,563	.....	.....	.....	.....	.....	$1,563
Bangor	.....	.....	.....	.....	.....	.....	.....	$130,100	130,100
Buffalo Creek	.....	.....	.....	.....	.....	.....	.....	.....	.....
Champlain	.....	.....	.....	516	$10,320	.....	.....	4,166,089	4,176,409
Detroit	.....	6	6	.....	.....	.....	.....	.....	6
Boston and Charlestown	.....	.....	.....	.....	.....	.....	.....	1,000	1,000
Mobile	.....	.....	.....	.....	.....	.....	.....	1,000	1,000
San Diego	.....	.....	.....	.....	.....	.....	.....	5,000	5,000
New York	$68,631	139,421	208,052	823,472	17,071,008	1,076	$22,060	32,757,690	50,058,810
San Francisco	.....	.....	.....	.....	.....	194	4,302	1,184,120	1,188,422
Saluria	.....	.....	.....	.....	.....	.....	.....	1,079	1,079
Cape Vincent	.....	.....	.....	.....	.....	.....	.....	30	30
Niagara	.....	.....	.....	.....	.....	4,593	91,261	312,468	403,729
Vermont	.....	.....	.....	.....	.....	363	5,786	116,099	121,885
Puget Sound	.....	.....	.....	.....	.....	.....	.....	119,962	119,962
Total	68,631	140,990	209,621	823,988	17,081,328	6,226	123,409	38,794,637	56,208,995

SILVER ORE, BULLION, AND COIN, BY COUNTRIES, ETC.—Continued.

SILVER.								
Contained in—			Silver ore.	Bullion.		Coin.		Total.
Copper regulus.	Base bullion.	Silver lead ore.		Ounces.	Value.	United States.	Foreign.	
.....	.....	$8,650	.....	.....	.....	.....	.....	$8,650
.....	.....	.....	.....	.....	.....	.....	$13	13
.....	.....	.....	.....	.....	.....	.....	148	148
.....	.....	.....	.....	.....	.....	$5,840	.....	5,840
.....	.....	.....	.....	.....	.....	133	.....	133
.....	.....	.....	.....	.....	.....	.....	5,459	5,459
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	200	200
$249,453	$11,156,113	6,477,497	$478,937	5,846,786	$3,790,461	160,782	7,869,474	30,182,717

FROM CERTAIN CUSTOMS DISTRICTS OF THE UNITED STATES DURING THE CALENDAR YEAR ENDING DECEMBER 31, 1896.

SILVER.								
Base bullion.	Ore.	Total.	U. S. Mint or assay office bars.		Other bars.		Coin.	Total.
Value.	Value.	Value.	Ounces.	Value.	Ounces.	Value.	Value.	Value.
.....	$14,070	$14,070	.....	.....	.....	.....	.....	$14,070
.....	.....	.....	.....	.....	375	$264	.....	264
.....	.....	.....	.....	.....	556	392	.....	392
.....	.....	.....	.....	.....	6,166	4,475	.....	4,475
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	$452	452
$249,517	729,088	978,605	135,118	$90,200	74,811,404	50,160,769	22,800	51,252,374
.....	.....	.....	.....	.....	8,801,324	5,910,148	73,900	5,984,048
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	53,920	34,955	6,838	41,793
.....	.....	.....	337	247	2,528	1,694	1,048	2,989
.....	.....	.....	.....	.....	.....	.....	10,951	10,951
249,517	743,158	992,675	135,455	90,447	83,676,273	56,112,697	115,989	57,311,808

XXIV.—Exports of Domestic Gold and Silver Ore, Bullion, and Coin to ended December

Countries.	GOLD.								
	Base bullion.	Ore.	Total.	United States mint or assay office bars.		Other bars.		Coin.	Total.
	Value.	Value.	Value.	Ounces.	Value.	Ounces.	Value.	Value.	Value.
Nova Scotia, New Brunswick, etc								$130,100	$130,100
Quebec, Ontario, etc		$6	$6	516	$10,320	4,956	$97,047	4,594,686	4,702,059
Germany	$19,450	46,548	65,998	112,995	2,316,341	276	5,660	26,728,575	29,116,574
England	49,181	94,436	143,617	467,725	9,550,516	800	16,400	350,000	10,060,533
France				242,752	5,204,151			2,000,500	7,204,651
British West Indies								43,000	43,000
Haiti								820,485	820,485
Santo Domingo								108,668	108,668
Argentina								1,800,000	1,800,000
Venezuela								824,425	824,425
Scotland								300	300
Colombia								37,500	37,500
Cuba								75	75
Guatemala								28,060	28,060
San Salvador								365	365
Costa Rica								1,300	1,300
Nicaragua								500	500
British Honduras								41,000	41,000
China									
Hongkong						194	4,302	89,632	93,934
Japan									
Hawaiian Islands								1,065,278	1,065,278
Mexico								9,226	9,226
British East Indies									
Miquelon								1,000	1,000
British Africa									
British Columbia								119,962	119,962
Total	68,631	140,990	209,621	823,988	17,081,328	6,226	123,409	38,794,637	56,208,995

CERTAIN COUNTRIES FROM THE UNITED STATES DURING THE CALENDAR YEAR 31, 1896.

SILVER.								
Base bullion.	Ore.	Total.	United States mint or assay office bars.		Other bars.		Coin.	Total.
Value.	Value.	Value.	Ounces.	Value.	Ounces.	Value.	Value.	Value.
.....	.....	.....	.....	.....	375	$264	.....	$264
.....	.....	.....	337	$247	63,170	41,516	$7,886	49,649
.....	$8,208	$8,208	.....	.....	539	360	800	9,368
$249,517	734,950	984,467	133,703	89,200	68,996,708	46,228,419	.....	47,302,086
.....	.....	.....	.....	.....	5,718,520	3,867,292	.....	3,867,292
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	22,000	22,000
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	472,693	323,198	.....	323,198
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	2,289,834	1,535,190	.....	1,535,190
.....	.....	.....	.....	.....	794,303	525,100	.....	525,100
.....	.....	.....	.....	.....	5,286,760	3,556,358	.....	3,556,358
.....	.....	.....	.....	.....	.....	.....	73,900	73,900
.....	.....	.....	.....	.....	.....	.....	452	452
.....	.....	.....	.....	.....	53,371	35,000	.....	35,000
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	1,415	1,000	.....	.....	.....	1,000
.....	.....	.....	.....	.....	.....	.....	10,951	10,951
249,517	743,158	992,675	135,455	90,447	83,676,273	56,112,697	115,989	57,311,808

XXV.—EXPORTS OF FOREIGN GOLD AND SILVER FROM THE UNITED STATES, BY

Customs districts.	GOLD.				
	Base bullion.	Bullion.		Coin.	Total.
	Value.	Ounces.	Value.	Value.	Value.
Champlain					
Vermont					
Niagara				$400,000	$400,000
Bangor				81,900	81,900
Boston and Charlestown					
Saluria					
Paso del Norte					
Corpus Christi					
San Diego					
San Francisco					
Baltimore					
Philadelphia					
New York				1,565,483	1,565,483
New Orleans		26	$546		546
Mobile					
Galveston	$5,584				5,584
Total	5,584	26	546	2,047,383	2,053,513

XXVI.—EXPORTS OF FOREIGN GOLD AND SILVER FROM THE UNITED STATES TO

Countries.	GOLD.				
	Base bullion.	Bullion.		Coin.	Total.
	Value.	Ounces.	Value.	Value.	Value.
France				$1,269,890	$1,269,890
Germany				1,440	1,440
United Kingdom	$5,584	26	$546		6,130
Dominion of Canada:					
Quebec, Ontario, etc				400,000	400,000
Nova Scotia, New Brunswick, etc				81,900	81,900
Central American States:					
Honduras					
Nicaragua					
Guatemala					
British Honduras					
Cuba				49,883	49,883
Haiti					
Santo Domingo				199	199
Mexico				65,179	65,179
British West Indies					
Dutch West Indies					
Brazil					
Colombia					
Peru					
Venezuela				178,892	178,892
Hongkong					
China					
Japan					
British East Indies					
French Oceanica					
Total	5,584	26	546	2,047,383	2,053,513

CUSTOMS DISTRICTS, DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

SILVER.					
Base bullion.	Ore.	Bullion.		Coin.	Total.
Value.	Value.	Ounces.	Value.	Value.	Value.
.....	.....	.....	.....	$57,271	$57,271
.....	.....	.....	.....	38,794	38,794
.....	.....	.....	.....	1,210	1,210
.....	.....	.....	.....	2,730	2,730
.....	.....	.....	.....	4,000	4,000
.....	.....	.....	.....	107,009	107,009
.....	.....	.....	.....	9,500	9,500
.....	.....	.....	.....	50,970	50,970
.....	.....	.....	.....	5,462	5,462
.....	.....	.....	.....	3,953,336	3,953,336
.....	.....	.....	.....	131	131
.....	.....	.....	.....	650	650
.....	$730	1,000	$680	2,496,766	2,498,176
.....	.....	.....	.....	7,374	7,374
.....	.....	11,088	7,540	1,282	8,822
$60,310	.....	.....	.....	.....	60,310
60,310	730	12,088	8,220	6,736,485	6,805,745

CERTAIN COUNTRIES DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1896.

SILVER.					
Base bullion.	Ore.	Bullion.		Coin.	Total.
Value.	Value.	Ounces.	Value.	Value.	Value.
.....	.....	.....	.....	$58,200	$58,200
.....	.....	.....	.....	8,790	8,790
$60,310	$730	12,088	$8,220	1,953,176	2,022,436
.....	.....	.....	.....	97,275	97,275
.....	.....	.....	.....	6,730	6,730
.....	.....	.....	.....	485	485
.....	.....	.....	.....	2,425	2,425
.....	.....	.....	.....	1,282	1,282
.....	.....	.....	.....	4,949	4,949
.....	.....	.....	.....	2,077	2,077
.....	.....	.....	.....	2,000	2,000
.....	.....	.....	.....	399,960	399,960
.....	.....	.....	.....	191,407	191,407
.....	.....	.....	.....	13,132	13,132
.....	.....	.....	.....	183	183
.....	.....	.....	.....	35,063	35,063
.....	.....	.....	.....	781	781
.....	.....	.....	.....	23,300	23,300
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	2,720,446	2,720,446
.....	.....	.....	.....	1,000,996	1,000,996
.....	.....	.....	.....	186,338	186,338
.....	.....	.....	.....	26,550	26,550
.....	.....	.....	.....	940	940
60,310	730	12,088	8,220	6,736,485	6,805,745

XXVII.—Recapitulation of Imports and Exports of the Precious Metals During the Fiscal Year Ended June 30, 1897.

Description.	Imports.	Exports.	Excess.	
			Imports.	Exports.
GOLD.				
Contained in—				
Copper matte	$11,652		$11,652	
Lead bullion	555,396	$68,631	486,765	
Lead bullion, foreign		5,584		$5,584
Silver-lead ore	1,194,648		1,194,648	
Ore	312,218	140,990	171,228	
Bars, United States Mint or Assay Office		17,081,328		17,081,328
Bullion—				
Foreign	21,392,343	546	21,391,797	
Domestic		123,409		123,409
Coin—				
Foreign	15,556,496	2,047,383	13,509,113	
Domestic	65,711,098	38,794,637	26,916,461	
Total	104,733,851	58,262,508	63,681,664	17,210,321
Excess of imports			46,471,343	
SILVER.				
Contained in—				
Copper matte	249,453		249,453	
Lead bullion	11,156,113	249,517	10,906,596	
Lead bullion, foreign		60,310		60,310
Silver-lead ore	6,477,497		6,477,497	
Ore—				
Domestic	478,937	743,158		264,221
Foreign		730		730
Bars, United States Mint or Assay Office		90,447		90,447
Bullion—				
Foreign	3,790,461	8,220	3,782,241	
Domestic		56,112,697		56,112,697
Coin—				
Foreign	7,869,474	6,736,485	1,132,989	
Domestic	160,782	115,989	44,793	
Total	30,182,717	64,117,553	22,593,569	56,528,405
Excess of exports				33,934,836

XXVIII.—Coinage of Nations.

Countries.	1894.		1895.		1896.	
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.
United States	$79,546,160	$9,200,351	$59,616,358	$5,698,010	$47,053,060	$23,089,899
Mexico	554,107	29,481,033	504,193	24,832,351	565,985	21,092,397
Great Britain	27,633,807	4,002,657	18,547,229	5,776,584	23,402,560	6,470,352
Australasia	35,203,648	.....	33,695,008	.....	34,602,786	.....
India[1]	.....	2,288,504	.....	4,044,935	.....	5,579,692
France	1,897,395	772,000	20,845,337	1,544,000	21,719,880	.....
Germany	37,433,154	1,067,945	25,588,334	1,826,038	25,133,476	2,718,368
Russia[2]	2,315,481	233,861	38,590,432	3,696,192	10,284	30,985,566
Finland	.....	41,365	.....	.....	.....	.....
Austria-Hungary[3]	40,395,456	10,742,232	18,208,728	9,056,188	33,898,739	7,904,911
Eritrea	.....	.....	.....	.....	.....	771,800
Spain	.....	3,946,225	.....	205,649	.....	5,386,942
Japan	1,576,440	24,131,363	1,515,000	23,883,505	1,125,000	13,399,062
Portugal	.....	478,440	.....	119,880	.....	1,900,800
Netherlands	70,897	160,800	135,692	140,700	.....	428,130
Norway	.....	120,600	.....	80,400	.....	67,000
Sweden	165,239	46,443	896,921	.....	.....	109,007
Denmark	.....	121,593	.....	.....	.....	.....
Switzerland	465,516	579,000	772,000	44,390	1,544,000	1,930
Turkey	84,403	450,018	3,420,717	414,483	50,114	7,473
Egypt	.....	.....	.....	.....	.....	562,770
Abyssinia	.....	30,759	.....	.....	.....	376
Liberia	.....	.....	.....	.....	.....	12,000
Hongkong	.....	2,100,000	.....	2,200,000	.....	1,700,000
China	.....	6,000,000	.....	8,253,340	.....	8,638,630
Indo China	.....	1,532,087	.....	6,092,709	.....	12,542,772
Tunis	232	347	232	347	232	347
Canada	.....	144,518	.....	.....	.....	140,000
Newfoundland	.....	58,000	.....	.....	.....	98,000
Costa Rica	.....	12,517	.....	.....	.....	.....
Haiti	.....	718,753	.....	730,285	.....	.....
Argentina	.....	.....	.....	.....	982,715	.....
Bolivia	.....	.....	.....	.....	.....	1,508,087
Peru	.....	4,360,153	.....	4,073,270	.....	2,704,831
Colombia	.....	8,252	.....	.....	.....	.....
Ecuador	.....	83,308	.....	1,102,073	.....	169,798
Venezuela	.....	193,000	.....	.....	.....	.....
Chile	.....	121,779	8,353,212	4,243,919	5,424,686	677,877
Urugnay	.....	.....	.....	1,000,000	.....	.....
Guatemala	.....	3,561,988	145	500,000	.....	.....
British Honduras	.....	50,000	.....	30,000	.....	.....
British West Indies	.....	9,733	.....	.....	.....	.....
Puerto Rico	.....	.....	.....	8,389,222	.....	167,240
German East Africa	.....	93,097	.....	.....	.....	392
German New Guinea	.....	47,608	11,900	.....	.....	.....
Monaco	.....	.....	386,000	.....	386,000	.....
Straits Settlements	.....	306,000	.....	450,446	.....	453,554
Congo State	.....	96,500	.....	.....	.....	193,000
Morocco	.....	327,337	.....	354,630	.....	589,985
Bulgaria	579,097	2,316,224	.....	.....	.....	.....
Roumania	.....	579,000	.....	.....	.....	.....
Ceylon	.....	142,110	.....	236,850	.....	.....
Siam	.....	2,338,288	.....	2,589,823	.....	3,322,752
Total	227,921,032	113,095,788	231,087,438	121,610,219	195,899,517	153,395,740

[1] Rupee calculated at coining rate, $0.4737. [2] Silver ruble calculated at coining rate, $0.7718.
[3] Florin calculated at coining rate, $0.4052, under the coinage act of August 2, 1892.

XXIX.—WORLD'S PRODUCTION OF GOLD AND

[Kilogram of gold, $664.60; kilogram of silver, $41.56,

	Countries.	1894.			
		Gold.		Silver.	
		Kilos.	*Dollars.*	*Kilos.*	*Dollars.*
1	United States	59,434	39,500,000	1,539,942	64,000,000
2	Australasia	62,836	41,760,800	562,263	23,367,700
3	Mexico	6,771	*a* 4,500,000	1,463,361	60,817,300
	European countries:				
4	Russia	36,313	24,133,400	8,580	356,600
5	Germany	*b* 3,221	2,140,700	193,000	8,021,100
6	Austria-Hungary	2,719	1,807,200	83,515	3,470,900
7	Sweden	94	62,500	2,869	119,200
8	Norway	.....	.....	4,705	195,500
9	Italy	*d* 176	117,000	*d* 28,885	1,200,500
10	Spain	.....	.....	63,605	2,643,400
11	Greece	.....	.....	35,436	1,472,700
12	Turkey	12	8,000	1,516	63,000
13	France	.....	.....	26,167	1,087,500
14	Great Britain	99	65,800	7,932	329,700
15	Dominion of Canada	1,568	1,042,100	26,371	1,096,000
	South American countries:				
16	Argentina	143	95,000	37,334	1,551,600
17	Colombia	*d* 4,353	2,892,800	*d* 52,511	2,182,400
18	Bolivia	101	*a* 67,000	684,418	28,444,400
19	Ecuador	103	68,400	*d* 240	10,000
20	Chile	698	*d* 464,400	88,680	3,685,500
21	Brazil	1,790	1,190,000	.....	.....
22	Venezuela	1,368	909,500	.....	.....
23	Guiana (British)	3,476	2,310,100	.....	.....
24	Guiana (Dutch)	979	*a* 650,800	.....	.....
25	Guiana (French)	3,920	2,605,200	.....	.....
26	Peru	112	74,400	100,695	4,184,900
27	Uruguay	*a* 23	15,400	.....	.....
28	Central American States	708	470,500	48,123	*g* 2,000,000
29	Japan	*i* 737	489,800	*i* 60,869	2,529,700
30	China	12,875	*a* 8,556,800	.....	.....
31	Africa	60,595	40,271,000	.....	.....
32	India (British)	5,842	3,882,900	.....	.....
33	Korea	703	467,200	.....	.....
34	Borneo	112	74,400	.....	.....
35	Madagascar	726	*a* 482,500	.....	.....
	Total	272,607	181,175,600	5,121,017	212,829,600

a Estimate of the Bureau of the Mint.

b Gold separated from silver in Germany, whose gold contents do not figure in the statistics of any other country.

c Estimated the same as officially communicated for 1895.

d Estimated the same as officially communicated for 1893.

e Estimated the same as officially communicated for 1894.

SILVER FOR CALENDAR YEARS 1894, 1895, AND 1896.

coining rate in United States silver dollars.]

1895.				1896.				
Gold.		Silver.		Gold.		Silver.		
Kilos.	*Dollars.*	*Kilos.*	*Dollars.*	*Kilos.*	*Dollars.*	*Kilos.*	*Dollars.*	
70,132	46,610,000	1,733,662	72,051,000	79,880	53,088,000	1,830,347	76,069,200	1
67,406	44,798,300	389,102	16,171,100	67,984	45,181,900	471,629	19,600,900	2
9,028	*a* 6,000,000	1,461,008	60,719,500	12,536	*a* 8,331,700	1,420,057	59,017,600	3
43,476	28,894,400	12,495	519,300	32,404	21,535,800	10,457	434,600	4
b 3,345	2,223,100	181,000	7,522,400	*b* 1,714	1,139,100	183,252	7,616,000	5
2,993	1,989,000	67,952	2,824,100	3,239	2,152,700	57,986	2,409,900	6
79	52,500	1,187	49,300	114	76,100	554	23,000	7
.....	.....	6,082	252,800	.....	.....	5,046	209,700	8
188	125,300	5,714	237,500	188	*e* 125,300	5,714	*c* 237,500	9
.....	.....	109,804	4,563,500	.....	.....	109,804	*c* 4,563,500	10
.....	.....	*c* 35,436	1,472,700	.....	.....	32,000	1,329,900	11
e 12	8,000	*e* 1,516	63,000	*e* 12	8,000	*e* 1,516	63,000	12
.....	.....	17,619	732,200	.....	.....	*c* 17,619	732,200	13
161	107,000	8,722	362,500	37	24,600	8,169	339,500	14
2,875	1,910,900	55,241	2,295,800	4,228	2,810,200	99,718	4,144,300	15
474	315,000	10,210	424,300	474	*c* 315,000	10,210	*e* 424,300	16
d 4,353	2,892,800	*d* 52,511	2,182,400	4,514	*a* 3,000,000	*d* 52,511	2,182,400	17
101	*a* 67,000	*e* 684,418	28,444,400	1,128	*a* 750,000	*a* 466,649	19,393,900	18
200	132,900	*d* 240	10,000	200	132,900	*d* 240	10,000	19
2,118	1,407,600	156,542	6,505,900	2,118	*c* 1,407,600	156,542	*c* 6,505,900	20
1,790	1,190,000	.....	.....	1,805	1,200,000	.....	.....	21
e 1,368	909,500	.....	.....	1,427	948,500	.....	.....	22
3,330	2,213,100	.....	.....	3,330	*c* 2,213,100	.....	.....	23
791	525,600	.....	.....	725	481,800	.....	.....	24
2,809	1,865,900	.....	.....	*c* 2,809	1,865,900	.....	.....	25
96	63,800	98,401	4,089,500	175	116,600	70,122	2,914,300	26
41	27,200	.....	.....	41	*c* 27,200	.....	.....	27
e 708	470,500	48,123	*g* 2,000,000	*e* 708	470,500	48,123	*g* 2,000,000	28
j 778	517,100	*j* 67,355	2,799,300	*h* 1,073	713,300	*h* 78,009	3,242,100	29
5,298	*a* 3,521,000	.....	.....	4,550	*a* 3,024,000	.....	.....	30
67,040	44,554,900	.....	.....	66,819	44,407,600	.....	.....	31
7,006	4,656,200	.....	.....	9,224	6,130,500	.....	.....	32
1,052	699,200	.....	.....	1,086	721,800	.....	.....	33
e 111	73,800	.....	.....	111	73,800	.....	.....	34
726	*a* 482,500	.....	.....	726	*a* 482,500	.....	.....	35
299,885	199,304,100	5,204,340	216,292,500	305,379	202,956,000	5,136,274	213,463,700	

f Estimated the same as officially communicated for 1891.
g Estimated the same as officially communicated for 1887.
h Product of Imperial mines, 1896; private mines, 1894.
i Product of Imperial mines, 1894; private mines, 1892.
j Product of Imperial mines, 1895; private mines, 1893.

XXX.—World's Production of Gold and

[Fine ounce of gold, $20.671834+; fine ounce of silver,

	Countries.	1894.			
		Gold.		Silver.	
		Ozs. fine.	*Dollars.*	*Ozs. fine.*	*Dollars.*
1	United States	1,910,813	39,500,000	49,500,000	64,000,000
2	Australasia	2,020,179	41,760,800	18,073,455	23,367,700
3	Mexico	217,688	*a* 4,500,000	47,038,381	60,817,300
	European countries:				
4	Russia	1,167,453	24,133,400	275,808	356,600
5	Germany	*b*103,566	2,140,700	6,203,820	8,021,100
6	Austria-Hungary	87,423	1,807,200	2,684,524	3,470,900
7	Sweden	3,024	62,500	92,194	119,200
8	Norway	.....	.....	151,207	195,500
9	Italy	*d* 5,660	117,000	*d*928,512	1,200,500
10	Spain	.....	.....	2,044,505	2,643,400
11	Greece	.....	.....	1,139,041	1,472,700
12	Turkey	387	8,000	48,727	63,000
13	France	.....	.....	841,113	1,087,500
14	Great Britain	3,183	65,800	255,002	329,700
15	Dominion of Canada	50,411	1,042,100	847,687	1,096,000
	South American countries:				
16	Argentina	4,596	95,000	1,200,066	1,551,600
17	Colombia	*d*139,939	2,892,800	*d*1,687,950	2,182,400
18	Bolivia	3,241	*a* 67,000	21,999,966	28,444,400
19	Ecuador	3,309	68,400	*d*7,734	10,000
20	Chile	22,466	*d* 464,400	2,850,503	3,685,500
21	Brazil	57,566	1,190,000	.....	.....
22	Venezuela	43,997	909,500	.....	.....
23	Guiana (British)	111,751	2,310,100	.....	.....
24	Guiana (Dutch)	*a* 31,482	650,800	.....	.....
25	Guiana (French)	126,026	2,605,200	.....	.....
26	Peru	3,599	74,400	3,236,759	4,184,900
27	Uruguay	745	15,400	.....	.....
28	Central American States	22,760	470,500	1,546,875	*g* 2,000,000
29	Japan	*i*23,694	489,800	*i*1,956,565	2,529,700
30	China	413,937	*a* 8,556,800	.....	.....
31	Africa	1,948,100	40,271,000	.....	.....
32	India (British)	187,835	3,882,900	.....	.....
33	Korea	22,600	467,200	.....	.....
34	Borneo	3,601	74,400	.....	.....
35	Madagascar	23,341	*a* 482,500	.....	.....
	Total	8,764,372	181,175,600	164,610,394	212,829,600

a Estimate of the Bureau of the Mint.

b Gold separated from silver in Germany, whose gold contents do not figure in the statistics of any other country.

c Estimated the same as officially communicated for 1895.

d Estimated the same as officially communicated for 1893.

e Estimated the same as officially communicated for 1894.

Silver for Calendar Years 1894, 1895, and 1896.

$1.292929+, coining rate in United States silver dollars.]

1895.				1896.				
Gold.		Silver.		Gold.		Silver.		
Ozs. fine.	*Dollars.*	*Ozs. fine.*	*Dollars.*	*Ozs. fine.*	*Dollars.*	*Ozs. fine.*	*Dollars.*	
2,254,760	46,610,000	55,726,945	72,051,000	2,568,132	53,088,600	58,834,800	76,069,200	1
2,167,118	44,798,300	12,507,335	16,171,100	2,185,676	45,181,900	15,160,077	19,600,900	2
290,250	*a* 6,000,000	46,962,738	60,719,500	403,046	*a* 8,331,700	45,646,424	59,017,600	3
1,397,767	28,894,400	401,646	519,300	1,041,794	21,535,800	336,127	434,600	4
b 107,542	2,223,100	5,818,106	7,522,400	*b* 55,104	1,139,100	5,890,500	7,616,000	5
96,218	1,989,000	2,184,265	2,824,100	104,137	2,152,700	1,863,921	2,409,900	6
2,540	52,500	38,130	49,300	3,681	76,100	17,822	23,000	7
.....	.....	195,525	252,800	.....	.....	162,198	209,700	8
6,063	125,300	183,655	237,500	6,063	*c* 125,300	183,655	*c* 237,500	9
.....	.....	3,529,582	4,563,500	.....	.....	3,529,582	*c* 4,563,500	10
.....	.....	*e* 1,139,041	1,472,700	.....	.....	1,028,609	1,329,900	11
e 387	8,000	*e* 48,727	63,000	*e* 387	8,000	*e* 48,727	63,000	12
.....	.....	566,346	732,200	.....	.....	*e* 566,346	732,200	13
5,176	107,000	280,371	362,500	1,188	24,600	262,567	339,500	14
92,440	1,910,900	1,775,658	2,295,800	135,943	2,810,200	3,205,343	4,144,300	15
15,238	315,000	328,170	424,300	15,238	*e* 315,000	328,170	*e* 424,300	16
d 139,939	2,892,800	*d* 1,687,950	2,182,400	145,125	*a* 3,000,000	*d* 1,687,950	2,182,400	17
3,241	*a* 67,000	*e* 21,999,966	28,444,400	36,281	*a* 750,000	*a* 15,000,000	19,393,900	18
6,429	132,900	*d* 7,734	10,000	6,429	132,900	*d* 7,734	10,000	19
68,092	1,407,600	5,031,907	6,505,900	68,092	*c* 1,407,600	5,031,907	*c* 6,505,900	20
57,566	1,190,000	.....	.....	58,050	1,200,000	.....	.....	21
e 43,997	909,500	.....	.....	45,882	948,500	.....	.....	22
107,059	2,213,100	.....	.....	107,059	*c* 2,213,100	.....	.....	23
25,426	525,600	.....	.....	23,309	481,800	.....	.....	24
90,263	1,865,900	.....	.....	90,263	1,865,900	.....	.....	25
3,086	63,800	3,162,973	4,089,500	5,639	116,600	2,254,021	2,914,300	26
1,316	27,200	.....	.....	1,316	*c* 27,200	.....	.....	27
e 22,760	470,500	1,546,875	*g* 2,000,000	*e* 22,760	470,500	1,546,875	*g* 2,000,000	28
j 25,015	517,100	*j* 2,165,084	2,799,300	*h* 34,506	713,300	*h* 2,507,532	3,242,100	29
170,328	*a* 3,521,000	.....	.....	146,285	*a* 3,024,000	.....	.....	30
2,155,343	44,554,900	.....	.....	2,148,218	44,407,600	.....	.....	31
225,244	4,656,200	.....	.....	296,563	6,130,500	.....	.....	32
33,824	699,200	.....	.....	34,915	721,800	.....	.....	33
3,569	73,800	.....	.....	3,569	*c* 73,800	.....	.....	34
23,341	*a* 482,500	.....	.....	23,341	*a* 482,500	.....	.....	35
9,641,337	199,304,100	167,288,729	216,292,500	9,817,991	202,956,000	165,100,887	213,463,700	

f Estimated the same as officially communicated for 1891.
g Estimated the same as officially communicated for 1887.
h Product of Imperial mines, 1896; private mines, 1894.
i Product of Imperial mines, 1894; private mines, 1892.
j Product of Imperial mines, 1895; private mines, 1893.

XXXI.—Production of Gold and Silver in

[From 1493 to 1885 is from a table of averages for certain periods, compiled by Dr. Adolph Soetbeer.

	Period.	GOLD.			
		Annual average for period.		Total for period.	
		Fine ounces.	Value.	Fine ounces.	Value.
1	1493–1520	186,470	$3,855,000	5,221,160	$107,931,000
2	1521–1544	230,194	4,759,000	5,524,656	114,205,000
3	1545–1560	273,596	5,656,000	4,377,544	90,492,000
4	1561–1580	219,906	4,546,000	4,398,120	90,917,000
5	1581–1600	237,267	4,905,000	4,745,340	98,095,000
6	1601–1620	273,918	5,662,000	5,478,360	113,248,000
7	1621–1640	266,845	5,516,000	5,336,900	110,324,000
8	1641–1660	281,955	5,828,000	5,639,110	116,571,000
9	1661–1680	297,709	6,154,000	5,954,180	123,084,000
10	1681–1700	346,095	7,154,000	6,921,895	143,088,000
11	1701–1720	412,163	8,520,000	8,243,260	170,403,000
12	1721–1740	613,422	12,681,000	12,268,440	253,611,000
13	1741–1760	791,211	16,356,000	15,824,230	327,116,000
14	1761–1780	665,666	13,761,000	13,313,315	275,211,000
15	1781–1800	571,948	11,823,000	11,438,970	236,464,000
16	1801–1810	571,563	11,815,000	5,715,627	118,152,000
17	1811–1820	367,957	7,606,000	3,679,568	76,063,000
18	1821–1830	457,044	9,448,000	4,570,444	94,479,000
19	1831–1840	652,291	13,484,000	6,522,913	134,841,000
20	1841–1850	1,760,502	36,393,000	17,605,018	363,928,000
21	1851–1855	6,410,324	132,513,000	32,051,621	662,566,000
22	1856–1860	6,486,262	134,083,000	32,431,312	670,415,000
23	1861–1865	5,949,582	122,989,000	29,747,913	614,944,000
24	1866–1870	6,270,086	129,614,000	31,350,430	648,071,000
25	1871–1875	5,591,014	115,577,000	27,955,068	577,883,000
26	1876–1880	5,543,110	114,586,000	27,715,550	572,931,000
27	1881–1885	4,794,755	99,116,000	23,973,773	495,582,000
28	1886	5,135,679	106,163,900	5,135,679	106,163,900
29	1887	5,116,861	105,774,900	5,116,861	105,774,900
30	1888	5,330,775	110,196,900	5,330,775	110,196,900
31	1889	5,973,790	123,489,200	5,973,790	123,489,200
32	1890	5,749,306	118,848,700	5,749,306	118,848,700
33	1891	6,320,194	130,650,000	6,320,194	130,650,000
34	1892	7,094,266	146,651,500	7,094,266	146,651,500
35	1893	7,618,811	157,494,800	7,618,811	157,494,800
36	1894	8,764,362	181,175,600	8,764,362	181,175,600
37	1895	9,641,337	199,304,100	9,641,337	199,304,100
38	1896	9,817,991	202,956,000	9,817,991	202,956,000
	Total			434,568,089	8,983,320,600

THE WORLD SINCE THE DISCOVERY OF AMERICA.

For the years 1886 to 1896 the production is the annual estimate of the Bureau of the Mint.]

SILVER.				PERCENTAGE OF PRODUCTION.				
Annual average for period.		Total for period.		By weight.		By value.		
Fine ounces.	Coining value	Fine ounces.	Coining value.	Gold.	Silver.	Gold.	Silver.	
1,511,050	$1,954,000	42,309,400	$54,703,000	11	89	66.4	33.6	1
2,899,930	3,740,000	69,598,320	89,986,000	7.4	92.6	55.9	44.1	2
10,017,940	12,952,000	160,287,040	207,240,000	2.7	97.3	30.4	69.6	3
9,628,925	12,450,000	192,578,500	248,990,000	2.2	97.8	26.7	73.3	4
13,467,635	17,413,000	269,352,700	348,254,000	1.7	98.3	22	78	5
13,596,235	17,579,000	271,924,700	351,579,000	2	98	24.4	75.6	6
12,654,240	16,361,000	253,084,800	327,221,000	2.1	97.9	25.2	74.8	7
11,776,545	15,226,000	235,530,900	304,525,000	2.3	97.7	27.7	72.3	8
10,834,550	14,008,000	216,691,000	280,166,000	2.7	97.3	30.5	69.5	9
10,992,085	14,212,000	219,841,700	284,240,000	3.1	96.9	33.5	66.5	10
11,432,540	14,781,000	228,650,803	295,629,000	3.5	96.5	36.6	63.4	11
13,863,080	17,924,000	277,261,600	358,480,000	4.2	95.8	41.4	58.6	12
17,140,612	22,162,000	342,812,235	443,232,000	4.4	95.6	42.5	57.5	13
20,985,591	27,133,000	419,711,820	542,658,000	3.1	96.9	33.7	66.3	14
28,261,779	36,540,000	565,235,580	730,810,000	2	98	24.4	75.6	15
28,746,922	37,168,000	287,469,225	371,677,000	1.9	98.1	24.1	75.9	16
17,385,755	22,479,000	173,857,555	224,780,000	2.1	97.9	25.3	74.7	17
14,807,004	19,144,000	148,070,040	191,444,000	3	97	33	67	18
19,175,867	24,703,000	191,758,675	247,930,000	3.3	96.7	35.2	64.8	19
25,090,342	32,440,000	250,903,422	324,400,000	6.6	93.4	52.9	47.1	20
28,488,597	36,824,000	142,442,986	184,169,000	18.4	81.6	78.3	21.7	21
29,095,428	37,618,000	145,477,142	188,092,000	18.2	81.8	78.1	21.9	22
35,401,972	45,772,000	177,009,862	228,861,000	14.4	85.6	72.9	27.1	23
43,051,583	55,663,000	215,257,914	278,313,000	12.7	87.3	70	30	24
63,317,014	81,864,000	316,585,069	409,322,000	8.1	91.9	58.5	41.5	25
78,775,602	101,851,000	393,878,009	509,256,000	6.6	93.4	53	47	26
92,003,944	118,955,000	460,019,722	594,773,000	5	95	45.5	54 5	27
93,297,290	120,626,800	93,297,290	120,626,800	5.2	94.8	46.8	53.2	28
96,123,586	124,281,000	96,123,586	124,281,000	5	95	45 9	54.1	29
108,827,606	140,706,400	108,827,606	140,706,400	4.6	95.4	43.9	56.1	30
120,213,611	155,427,700	120,213,611	155,427,700	4.7	95.3	44.3	55.7	31
126,095,062	163,032,000	126,095,062	163,032,000	4.3	95.7	42.1	57.9	32
137,170,919	177,352,300	137,170,919	177,352,300	4.4	95.6	42.4	57.6	33
153,151,762	198,014,400	153,151,762	198,014,400	4.4	95.6	42.5	57.5	34
165,472,621	213,944,400	165,472,621	213,944,400	4.4	95.6	42.4	57.6	35
164,610,394	212,829,600	164,610,394	212,829,600	5	95	46.3	53.7	36
167,288,729	216,292,500	167,288,729	216,292,500	5.4	94.6	47.7	52.3	37
165,100,887	213,463,700	165,100,887	213,463,700	5.6	94.4	48.7	51.3	38
.....	.....	8,164,953,183	10,556,700,800	5	95	46	54	

XXXII.—Coinage of the Mints of the United States from their Organization, 1792, to December 31, 1896.

Denomination.	Pieces.	Value.
GOLD.		
Double eagles	64,989,929	$1,299,798,580.00
Eagles	26,827,647	268,276,470.00
Half eagles	44,256,734	221,283,670.00
Three-dollar pieces (coinage discontinued under act of Sept. 26, 1890)	539,792	1,619,376.00
Quarter eagles	11,497,723	28,744,307.50
Dollars (coinage discontinued under act of Sept. 26, 1890)	19,499,337	19,499,337.00
Total gold	167,611,162	1,839,221,740.50
SILVER.		
Dollars (coinage discontinued, act of Feb. 12, 1873, and resumed under act of Feb. 28, 1878)	451,197,629	*a* 451,197,629.00
Trade dollars	35,965,924	35,965,924.00
Half dollars	267,241,011	133,620,505.50
Half dollars, Columbian souvenir	5,002,105	2,501,052.50
Quarter dollars	207,261,056	51,815,264.00
Quarter dollars, Columbian souvenir	40,023	10,005.75
Twenty-cent pieces (coinage discontinued, act of May 2, 1878)	1,355,000	271,000.00
Dimes	291,538,411	29,153,841.10
Half dimes (coinage discontinued, act Feb. 12, 1873)	97,604,388	4,880,219.40
Three-cent pieces (coinage discontinued, act Feb. 12, 1873)	42,736,240	1,282,087.20
Total silver	1,399,941,787	710,697,528.45
MINOR.		
Five-cent pieces, nickel	289,897,414	14,494,870.70
Three-cent pieces, nickel (coinage discontinued, act Sept. 26, 1890)	31,378,316	941,349.48
Two-cent pieces, bronze (coinage discontinued, act Feb. 12, 1873)	45,601,000	912,020.00
One-cent pieces, copper (coinage discontinued, act Feb. 21, 1857)	156,288,744	1,562,887.44
One-cent pieces, nickel (coinage discontinued, act Apr. 22, 1864)	200,772,000	2,007,720.00
One-cent pieces, bronze	823,790,755	8,237,907.55
Half-cent pieces, copper (coinage discontinued, act Feb. 21, 1857)	7,985,222	39,926.11
Total minor	1,555,713,451	28,196,681.28
Total coinage	3,123,266,400	2,578,115,950.23

a Silver-dollar coinage under act of—

April 2, 1792		$8,031,238
February 28, 1878	$378,166,793	
July 14, 1890	59,921,126	
March 3, 1891	5,078,472	
		443,166,391
Total		451,197,629

XXXIII.—Coinage of Fractional and Subsidiary Silver Coins, by Acts and Denominations, from 1792 to 1896.

Denomination.	1792 to 1853.	1853 to Feb. 12, 1873.	Feb. 12, 1873, to Dec. 31, 1896.	Total silver.
Dollars	$2,506,890.00	$5,524,348.00	$443,166,391.00	$451,197,629.00
Trade dollars			35,965,924.00	35,965,924.00
Total dollars	2,506,890.00	5,524,348.00	479,132,315.00	487,163,553.00
Half dollars	66,280,640.50	32,666,832.50	34,673,032.50	133,620,505.50
Half dollars, Columbian			2,501,052.50	2,501,052.50
Quarter dollars	3,994,040.50	17,879,790.50	29,941,433.00	51,815,264.00
Quarter dollars, Columbian			10,005.75	10,005.75
Twenty-cent pieces			271,000.00	271,000.00
Dimes	3,890,230.10	4,908,520.00	20,355,091.00	29,153,841.10
Half dimes	1,825,126.40	3,055,093.00		4,880,219.40
Three-cent pieces	744,927.00	537,160.20		1,282,087.20
Total subsidiary	76,734,964.50	59,047,396.20	87,751,614.75	223,533,975.45
Total silver	79,241,854.50	64,571,744.20	566,883,929.75	710,697,528.45

Fractional silver coinage, 1792 to 1853	$76,734,964.50
Subsidiary silver coinage, 1853 to February 12, 1873	59,047,396.20
Subsidiary silver coinage, February 12, 1873, to December 31, 1896	87,751,614.75
Total	223,533,975.45

XXXIV.—Coinage of the Mints of the United States

[Coinage of the mint at Philadelphia from

Calendar years.	GOLD COINAGE.					
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles.	Dollars.
1793 to 1795		$27,950	$43,535			
1796		60,800	16,995		$165.00	
1797		91,770	32,030		4,390.00	
1798		79,740	124,335		1,535.00	
1799		174,830	37,255		1,200.00	
1800		259,650	58,110			
1801		292,540	130,030			
1802		150.900	265,880		6,530.00	
1803		89,790	167,530		1,057.50	
1804		97,950	152,375		8,317.50	
1805			165,915		4,452.50	
1806			320,465		4,040.00	
1807			420,465		17,030.00	
1808			277,890		6,775.00	
1809			169,375			
1810			501,435			
1811			497,905			
1812			290,435			
1813			477,140			
1814			77,270			
1815			3,175			
1816						
1817						
1818			242,940			
1819			258,615			
1820			1,319,030			
1821			173,205		16,120.00	
1822			88,980			
1823			72,425			
1824			86,700		6,500.00	
1825			145,300		11,085.00	
1826			90,345		1,900.00	
1827			124,565		7,000.00	
1828			140,145			
1829			287,210		8,507.50	
1830			631,755		11,350.00	
1831			702,970		11,300.00	
1832			787,435		11,000.00	
1833			968,150		10,400.00	
1834			3,660,845		293,425.00	
1835			1,857,670		328,505.00	
1836			2,765,735		1,369,965.00	
1837			1,035,605		112,700.00	
1838		72,000	1,432,940		117,575.00	
1839		382,480	590,715		67,552.50	
1840		473,380	686,910		47,147.50	
1841		631,310	79,165			
1842		815,070	137,890		7,057.50	
1843		754,620	3,056,025		251,365.00	
Carried forward		4,454,780	25,652,815		2,745,947.50	

Note.—Not susceptible of exact statement by years of actual date of coin, the registry of annual having been invariably completed within the year of the date of coin, as now required.

FROM THEIR ORGANIZATION, BY CALENDAR YEARS.

its organization, 1793, to June 30, 1897.]

SILVER COINAGE.							
Trade dollars.	Dollars.	Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Half dimes.	Three cents.
.....	$204,791	$161,572.00	.....	.....	.....	$4,320.80	.....
.....	72,920	.....	$1,473.50	.....	$2,213.50	511.50	.....
.....	7,776	1,959.00	63.00	.....	2,526.10	2,226.35	.....
.....	327,536	.....	.....	.....	2,755.00	.....	.....
.....	423,515	.....	.....	.....	.....	.....	.....
.....	220,920	.....	.....	.....	2,176.00	1,200.00	.....
.....	54,454	15,144.50	.....	.....	3,464.00	1,695.50	.....
.....	41,650	14,945.00	.....	.....	1,097.50	650.50	.....
.....	66,064	15,857.50	.....	.....	3,304.00	1,892.50	.....
.....	19,570	78,259.50	1,684.50	.....	826.50	.....	.....
.....	321	105,861.00	30,348.50	.....	12,078.00	780.00	.....
.....	.....	419,788.00	51,531.00	.....	.....	.....	.....
.....	.....	525,788.00	55,160.75	.....	16,500.00	.....	.....
.....	.....	684,300.00	.....	.....	.....	.....	.....
.....	.....	702,905.00	.....	.....	4,471.00	.....	.....
.....	.....	638,138.00	.....	.....	635.50	.....	.....
.....	.....	601,822.00	.....	.....	6,518.00	.....	.....
.....	.....	814,029.50	.....	.....	.....	.....	.....
.....	.....	620,951.50	.....	.....	.....	.....	.....
.....	.....	519,537.50	.....	.....	42,150.00	.....	.....
.....	.....	.....	17,308.00	.....	.....	.....	.....
.....	.....	23,575.00	5,000.75	.....	.....	.....	.....
.....	.....	607,783.50	.....	.....	.....	.....	.....
.....	.....	980,161.00	90,293.50	.....	.....	.....	.....
.....	.....	1,104,000.00	36,000.00	.....	.....	.....	.....
.....	.....	375,561.00	31,861.00	.....	94,258.70	.....	.....
.....	.....	652,898.50	54,212.75	.....	118,651.20	.....	.....
.....	.....	779,786.50	16,020.00	.....	10,000.00	.....	.....
.....	.....	847,100.00	4,450.00	.....	44,000.00	.....	.....
.....	.....	1,752,477.00	.....	.....	.....	.....	.....
.....	.....	1,471,583.00	42,000.00	.....	51,000.00	.....	.....
.....	.....	2,002,090.00	.....	.....	.....	.....	.....
.....	.....	2,746,700.00	1,000.00	.....	121,500.00	.....	.....
.....	.....	1,537,600.00	25,500.00	.....	12,500.00	.....	.....
.....	.....	1,856,078.00	.....	.....	77,000.00	61,500.00	.....
.....	.....	2,382,400.00	.....	.....	51,000.00	62,000.00	.....
.....	.....	2,936,830.00	99,500.00	.....	77,135.00	62,135.00	.....
.....	.....	2,398,500.00	80,000.00	.....	52,250.00	48,250.00	.....
.....	.....	2,603,000.00	39,000.00	.....	48,500.00	68,500.00	.....
.....	.....	3,206,002.00	71,500.00	.....	63,500.00	74,000.00	.....
.....	.....	2,676,003.00	488,000.00	.....	141,000.00	138,000.00	.....
.....	1,000	3,273,100.00	118,000.00	.....	119,000.00	95,000.00	.....
.....	.....	1,814,910.00	63,100.00	.....	104,200.00	113,800.00	.....
.....	.....	1,773,000.00	208,000.00	.....	199,250.00	112,750.00	.....
.....	300	1,667,280.00	122,786.50	.....	105,311.50	53,457.50	.....
.....	61,005	717,504.00	47,031.75	.....	135,858.00	67,204.25	.....
.....	173,000	155,000.00	30,000.00	.....	162,250.00	57,500.00	.....
.....	184,618	1,006,382.00	22,000.00	.....	188,750.00	40,750.00	.....
.....	165,100	1,922,000.00	161,400.00	.....	137,000.00	58,250.00	.....
.....	2,024,540	51,190,162.50	2,014,225.50	.....	2,214,629.50	1,126,373.90	.....

coinage being of coin delivered by coiners of mints within the given year, and these deliveries not

Coinage of the Mints of the United States

[Coinage of the mint at Philadelphia from

Calendar years.	GOLD COINAGE.					
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles.	Dollars.
Brought forward	.....	$4,454,780	$25,652,815	.....	$2,745,947.50	.....
1844	.....	63,610	1,701,650	.....	16,960.00	.....
1845	.....	261,530	2,085,495	.....	227,627.50	.....
1846	.....	200,950	1,979,710	.....	53,995.00	.....
1847	.....	8,622,580	4,579,905	.....	74,535.00	.....
1848	.....	1,454,840	1,303,875	.....	22,215.00	.....
1849	.....	6,536,180	665,350	.....	58,235.00	$688,567
1850	$23,405,220	2,914,510	322,455	.....	632,307.50	481,953
1851	41,743,100	1,763,280	1,887,525	.....	3,431,870.00	3,317,671
1852	41,060,520	2,631,060	2,869,505	.....	2,899,202.50	2,045,351
1853	25,226,520	2,012,530	1,528,850	.....	3,511,670.00	4,076,051
1854	15,157,980	542,500	803,375	$415,854	1,490,645.00	1,639,445
1855	7,293,320	1,217,010	585,490	151,665	588,700.00	758,269
1856	6,597,560	604,900	989,950	78,030	960,600.00	1,762,936
1857	8,787,500	166,060	490,940	62,673	535,325.00	774,789
1858	4,234,280	25,210	75,680	6,399	118,442.50	117,995
1859	871,940	160,930	84,076	46,914	98,610.00	168,244
1860	11,553,400	117,830	99,125	21,465	56,687.50	36,668
1861	59,529,060	1,132,330	3,199,750	18,216	3,181,295.00	527,499
1862	1,842,660	109,950	22,325	17,355	280,882.50	1,326,865
1863	2,855,800	12,480	12,360	15,117	75.00	6,250
1864	4,085,700	35,800	21,100	8,040	7,185.00	5,950
1865	7,024,000	40,050	6,475	3,495	3,862.50	3,725
1866	13,975,500	37,800	33,600	12,090	7,775.00	7,180
1867	5,021,300	31,400	34,600	7,950	8,125.00	5,250
1868	1,972,000	106,550	28,625	14,625	9,062.50	10,525
1869	3,503,100	18,550	8,925	7,575	10,862.50	5,925
1870	3,103,700	25,350	20,175	10,605	11,387.50	6,335
1871	1,603,000	17,800	16,150	3,990	13,375.00	3,930
1872	5,037,600	16,500	8,450	6,090	7,575.00	3,530
1873	34,196,500	8,250	562,525	75	445,062.50	125,125
1874	7,336,000	531,600	17,540	125,460	9,850.00	198,820
1875	5,914,800	1,200	1,100	60	1,050.00	420
1876	11,678,100	7,320	7,385	135	10,552.50	3,245
1877	7,953,400	8,170	5,760	4,464	4,130.00	3,920
1878	10,872,900	738,000	658,700	246,972	715,650.00	3,020
1879	4,152,600	3,847,700	1,509,750	9,090	222,475.00	3,030
1880	1,029,120	16,448,760	15,832,180	3,108	7,490.00	1,636
1881	45,200	38,772,600	28,544,000	1,650	1,700.00	7,660
1882	12,600	23,244,800	12,572,800	4,620	10,100.00	5,040
1883	800	2,087,400	1,167,200	2,820	4,900.00	10,840
1884	1,420	769,050	955,240	3,318	4,982.50	6,206
1885	16,560	2,535,270	3,007,530	2,730	2,217.50	12,205
1886	22,120	2,361,600	1,942,160	3,426	10,220.00	6,016
1887	2,420	536,800	435	18,480	15,705.00	8,543
1888	4,525,320	1,329,960	91,480	15,873	40,245.00	16,080
1889	882,220	44,850	37,825	7,287	44,120.00	30,729
1890	1,519,900	580,430	21,640	.....	22,032.50	.....
1891	28,840	918,680	307,065	.....	27,600.00	.....
1892	90,460	7,975,520	3,767,860	.....	6,362.50	.....
1893	6,886,780	18,468,950	7,640,985	.....	75,265.00	.....
1894	27,379,800	24,707,780	4,789,775	.....	10,305.00	.....
1895	22,293,120	5,678,260	6,729,680	.....	15,297.50	.....
1896	15,853,260	763,480	295,315	.....	48,005.00	.....
January 1 to June 30, 1897	27,664,460	4,804,810	2,931,375	.....	26,572.50	.....
Total	485,843,460	192,446,090	144,515,605	1,357,716	22,846,927.50	18,223,438

a Includes Columbian souvenir half dollars, 1892, $475,000.

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

its organization, 1793, to June 30, 1897.]

SILVER COINAGE.							
Trade dollars.	Dollars.	Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Half dimes.	Three cents.
.....	$2,024,540	$51,190,162.50	$2.014,225.50	.....	$2,214,629.50	$1,126,373.90	.....
.....	20,000	883,000.00	105,300.00	.....	7,250.00	21,500.00	.....
.....	24,500	294,500.00	230,500.00	.....	175,500.00	78,200.00	.....
.....	110,600	1,105,000.00	127,500.00	.....	3,130.00	1,350.00	.....
.....	140,750	578,000.00	183,500.00	.....	24,500.00	63,700.00	.....
.....	15,000	290,000.00	36,500.00	.....	45,150.00	33,400.00	.....
.....	62,600	626,000.00	85,000.00	.....	83,900.00	65,450.00	.....
.....	7,506	113,500.00	47,700.00	.....	193,150.00	47,750.00	.....
.....	1,300	100,375.00	40,000.00	.....	102,650.00	39,050.00	$163,422.00
.....	1,100	38,565.00	44,265.00	.....	153,550.00	50,025.00	559,905.00
.....	46,110	1,766,354.00	3,813,555.00	.....	1,217,301.00	667,251.00	342,000.00
.....	33,140	1,491,000.60	3,095,000.00	.....	447,000.00	287,000.00	20,130.00
.....	26,000	379,750.00	714,250.00	.....	207,500.00	87,500.00	4,170.00
.....	63,500	469,000.00	1,816,000.00	.....	578,000.00	244,090.00	43,740.00
.....	94,000	994,000.00	2,411,000.00	.....	558,000.00	364,000.00	31,260.00
.....	.....	2,113,000.00	1,842,000.00	.....	154,000.00	175,000.00	48,120.00
.....	256,500	374,000.00	336,000.00	.....	43,000.00	17,000.00	10,950.00
.....	218,930	151,850.00	201,350.00	.....	60,700.00	39,950.00	8,610.00
.....	78,500	1,444,200.00	1,213,650.00	.....	192,400.00	164,050.00	14,940.00
.....	12,090	126,175.00	233,137.50	.....	84,755.00	74,627.50	10,906.50
.....	27,660	251,830.00	48,015.00	.....	1,446.00	923.00	643.80
.....	31,170	189,785.00	23,517.50	.....	3,907.00	23.50	14.10
.....	47,000	255,950.00	14,825.00	.....	1,050.00	675.00	255.00
.....	49,625	372,812.50	4,381.25	.....	872.50	536.25	681.75
.....	60,325	212,162.50	5,156.25	.....	662.50	431.25	138.75
.....	182,700	189,100.00	7,500.00	.....	46,625.00	4,295.00	123.00
.....	424,300	397,950.00	4,150.00	.....	25,660.00	10,430.00	153.00
.....	433,000	300,450.00	21,850.00	.....	47,150.00	26,830.00	120.00
.....	1,115,760	582,680.00	42,808.00	.....	75,361.00	74,443.00	127.80
.....	1,106,450	440,775.00	45,737.50	.....	239,645.00	147,397.50	58.50
$397,500	293,600	1,308,750.00	371,075.00	.....	394,710.00	35,630.00	18.00
987.800	.....	1,180,150.00	117,975.00	.....	294,070.00	.....	.....
218,900	.....	3,613,750.00	1,073,375.00	$7,940	1,035,070.00	.....	.....
456,150	.....	4,209,575.00	4,454,287.50	3,180	1,146,115.00	.....	.....
3,039,710	.....	4,152,255.00	2,727,927.50	102	731,051.00	.....	.....
900	10,509,550	689,200.00	565,200.00	120	167,880.00	.....	.....
1,541	14,807,100	2,950.00	3,675.00	.....	1,510.00	.....	.....
1,987	12,601,355	4,877.50	3,738.75	.....	3,735.50	.....	.....
960	9,163,975	5,487.50	3,243.75	.....	2,497.50	.....	.....
1.097	11,101,100	2,750.00	4,075.00	.....	391,110.00	.....	.....
979	12,291,039	4,519.50	3,859.75	.....	767,571.20	.....	.....
.....	14,070,875	2,637.50	2,218.75	.....	336,638.00	.....	.....
.....	17,787,767	3,065.00	3,632.50	.....	253,342.70	.....	.....
.....	19,963,886	2,943.00	1,471.50	.....	637,757.00	.....	.....
.....	20,290,710	2,855.00	2,677.50	.....	1,128,393.90	.....	.....
.....	19,183,833	6,416.50	2,708.25	.....	549,648.70	.....	.....
.....	21,726,811	6,355.50	3,177.75	.....	738,071.10	.....	.....
.....	16,802,590	6,295.00	20,147.50	.....	991,154.10	.....	.....
.....	8,694,206	100,300.00	980,150.00	.....	1,531,060.00	.....	.....
.....	1,037,245	*a*942,622.50	2,059,311.25	.....	1,212,124.50	.....	.....
.....	378,792	*b*2.939,448.50	*c*1,371,203.75	.....	334,079.20	.....	.....
.....	110,972	574,486.00	858,243.00	.....	133,097.20	.....	.....
.....	12,880	917,609.00	1,110,220.00	.....	69,088.00	.....	.....
.....	9,976,762	475,381.00	968,690.50	.....	200,076.20	.....	.....
.....	1,372,351	257,175.50	464,087.75	.....	205,888.40	.....	.....
5,107,524	228,892,049	88,533,781.00	35,984,745.75	11,342	20,244,183.70	3,948,791.90	1,260,487.20

b Includes Columbian souvenir half dollars, 1893, $2,026,052.50.
c Includes Columbian souvenir quarter dollars, 1893, $10,005.75.

COINAGE OF THE MINTS OF THE UNITED STATES

[Coinage of the mint at Philadelphia from

Calendar years.	MINOR COINAGE.		
	Five cents.	Three cents.	Two cents.
1793-1795			
1796			
1797			
1798			
1799			
1800			
1801			
1802			
1803			
1804			
1805			
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1832			
1833			
1834			
1835			
1836			
1837			
1838			
1839			
1840			
1841			
1842			
1843			
Carried forward			

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

its organization, 1793, to June 30, 1897.]

MINOR COINAGE.		TOTAL COINAGE.			TOTAL VALUE.
Cents.	Half cents.	Gold.	Silver.	Minor.	
$10,660.33	$712.67	$71,485.00	$370,683.80	$11,373.00	$453,541.80
9,747.00	577.40	77,960.00	77,118.50	10,324.40	165,402.90
8,975.10	535.24	128,190.00	14,550.45	9,510.31	152,250.79
9,797.00	.....	205,610.00	330,291.00	9,797.60	545,698.00
9,045.85	60.83	213,285.00	423,515.00	9,106.68	645,906.68
28,221.75	1,057.65	317,760.00	224,296.00	29,279.40	571,335.40
13,628.37	.....	422,570.00	74,758.00	13,628.37	510,956.37
34,351.00	71.83	423,310.00	58,343.00	34,422.83	516,075.83
24,713.53	489.50	258,377.50	87,118.00	25,203.03	370,698.53
7,568.38	5,276.56	258,642.50	100,340.50	12,844.94	371,827.94
9,411.16	4,072.32	170,367.50	149,388.50	13,483.48	333,239.48
3,480.00	1,780.00	324,505.00	471,319.00	5,260.00	801,084.00
7,272.21	2,380.00	437,495.00	597,448.75	9,652.21	1,044,595.96
11,090.00	2,000.00	284,665.00	684,300.00	13,090.00	982,055.00
2,228.67	5,772.86	169,375.00	707,376.00	8,001.53	884,752.53
14,585.00	1,075.00	501,435.00	638,773.50	15,660.00	1,155,868.50
2,180.25	315.70	497,905.00	608,340.00	2,495.95	1,108,740.95
10,755.00	.....	290,435.00	814,029.50	10,755.00	1,115,219.50
4,180.00	.....	477,140.00	620,951.50	4,180.00	1,102,271.50
3,578.30	.....	77,270.00	561,687.50	3,578.30	642,535.80
.....	.....	3,175.00	17,308.00	.....	20,483.00
28,209.82	.....	.....	28,575.75	28,209.82	56,785.57
39,484.00	.....	.....	607,783.50	39,484.00	647,267.50
31,670.00	.....	242,940.00	1,070,454.50	31,670.00	1,345,064.50
26,710.00	....	258,615.00	1,140,000.00	26,710.00	1,425,325.00
44,075.50	.....	1,319,030.00	501,680.70	44,075.50	1,864,786.20
3,890.00	.....	189,325.00	825,762.45	3,890.00	1,018,977.45
20,723.39	.....	88,980.00	805,806.50	20,723.39	915,509.89
.....	....	72,425.00	895,550.00	.....	967,975.00
12,620.00	.....	93,200.00	1,752,477.00	12,620.00	1,858,297.00
14,611.00	315.00	156,385.00	1,564,583.00	14,926.00	1,735,894.00
15,174.25	1,170.00	92,245.00	2,002,090.00	16,344.25	2,110,679.25
23,577.32	.....	131,565.00	2,869,200.00	23,577.32	3,024,342.32
22,606.24	3,030.00	140,145.00	1,575,600.00	25,636.24	1,741,381.24
14,145.00	2,435.00	295,717.50	1,994,578.00	16,580.00	2,306,875.50
17,115.00	.....	643,105.00	2,495,400.00	17,115.00	3,155,620.00
33,592.60	11.00	714,270.00	3,175,600.00	33,603.60	3,923,473.60
23,620.00	.....	798,435.00	2,579,000.00	23,620.00	3,401,055.00
27,390.00	770.00	978,550.00	2,759,000.00	28,160.00	3,765,710.00
18,551.00	600.00	3,954,270.00	3,415,002.00	19,151.00	7,388,423.00
38,784.00	705.00	2,186,175.00	3,443,003.00	39,489.00	5,668,667.00
21,110.00	1,990.00	4,135,709.00	3,606,100.00	23,100.00	7,764,900.00
55,583.00	.....	1,148,305.00	2,096,010.00	55,583.00	3,299,898.00
63,702.00	.....	1,622,515.00	2,293,000.00	63,702.00	3,979,217.00
31,286.61	.....	1,040,747.50	1,949,135.50	31,286.61	3,021,169.61
24,627.00	.....	1,207,437.50	1,028,603.00	24,627.00	2,260,667.50
15,973.67	.....	710,475.00	577,750.00	15,973.67	1,304,198.67
23,833.90	.....	960,017.50	1,442,500.00	23,833.90	2,426,351.40
24,283.20	.....	4,062,010.00	2,443,750.00	24,283.20	6,530,043.20
942,417.40	37,203.56	32,853,542.50	58,569,931.40	979,620.96	92,403,094.86

Coinage of the Mints of the United States

[Coinage of the mint at Philadelphia from

Calendar years.	MINOR COINAGE.		
	Five cents.	Three cents.	Two cents.
Brought forward			
1844			
1845			
1846			
1847			
1848			
1849			
1850			
1851			
1852			
1853			
1854			
1855			
1856			
1857			
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1859			
1860			
1861			
1862			
1863			
1864			$396,950.00
1865		$341,460.00	272,860.00
1866	$737,125.00	144,030.00	63,540.00
1867	1,545,475.00	117,450.00	58,775.00
1868	1,440,850.00	97,560.00	56,075.00
1869	819,750.00	48,120.00	30,930.00
1870	240,300.00	40,050.00	17,225.00
1871	28,050.00	18,120.00	14,425.00
1872	301,800.00	25,860.00	1,300.00
1873	227,500.00	35,190.00	
1874	176,900.00	23,700.00	
1875	104,850.00	6,840.00	
1876	126,500.00	4,860.00	
1877			
1878	117.50	70.50	
1879	1,455.00	1,236.00	
1880	997.75	748.65	
1881	3,618.75	32,417.25	
1882	573,830.00	759.00	
1883	1,148,471.05	318.27	
1884	563,697.10	169.26	
1885	73,824.50	143.70	
1886	166,514.50	128.70	
1887	763,182.60	238.83	
1888	536,024.15	1,232.49	
1889	794,068.05	646.83	
1890	812,963.60		
1891	841,717.50		
1892	584,982.10		
1893	668,509.75		
1894	270,656.60		
1895	498,994.20		
1896	442,146.00		
January 1 to June 30, 1897	407,184.05		
Total	14,902,054.75	941,349.48	912,020.00

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

its organization, 1793, to June 30, 1897.]

MINOR COINAGE.		TOTAL COINAGE.			TOTAL VALUE.
Cents.	Half cents.	Gold.	Silver.	Minor.	
$942,417.40	$37,203.56	$32,853,542.50	$58,569,931.40	$979,620 96	$92,403,094.86
23,987.52	.....	1,782,220.00	1,037,050.00	23,987.52	2,843,257.52
38,948.04	.....	2,574,652.50	803,200.00	38,948.04	3,416,800.54
41,208.00	.....	2,234,655.00	1,347,580.00	41,208.00	3,623,443.00
61,836.69	.....	13,277,020.00	990,450.00	61,836.69	14,329,306.69
64,157.99	.....	2,780,930.00	420,050.00	64,157.99	3,265,137.99
41,785.00	199.32	7,948,332.00	922,950.00	41,984.32	8,913,266.32
44,268.44	199.06	27,756,445.50	409,600.00	44,467.50	28,210,513.00
98,897.07	738.36	52,143,446.00	446,797.00	99,635.43	52,689,878.43
50,630.94	.....	51,505,638.50	847,410.00	50,630.94	52,403,679.44
66,411.31	648.47	36,355,621.00	7,852,571.00	67,059.78	44,275,251.78
42,361.56	276.79	20,049,799.00	5,373,270.00	42,638.35	25,465,707.35
15,748.29	282.50	10,594,454.00	1,419,170.00	16,030.79	12,029,654.79
26,904.63	202.15	10,993,976.00	3,214,240.00	27,106.78	14,235,322.78
177,834.56	175.90	10,817,287.00	4,452,260.00	178,010.46	15,447,557.46
246,000.00	.....	4,578,006.50	4,332,120.00	246,000.00	9,156,126.50
364,000.00	.....	1,430,708.00	1,037,450.00	364,000.00	2,832,158.00
205,660.00	.....	11,885,175.50	681,390.00	205,660.00	12,772,225.50
101,000.00	.....	67,588,150.00	3,107,740.00	101,000,00	70,796,890.00
280,750.00	.....	3,600,037.50	541,691.50	280,750.00	4,422,479 00
498,400.00	.....	2,902,082.00	330,517.80	498,400.00	3,730,999.80
529,737.14	.....	4,163,775.00	248,417.10	926,687.14	5,338,879.24
354,292.86	.....	7,081,607.50	319,755.00	968,552.86	8,369,915.36
98,265.00	.....	14,073,945.00	428,909.25	1,042,960.00	15,545,814.25
98,210.00	.....	5,108,625.00	278,876.25	1,819,910.00	7,207,411.25
102,665.00	.....	2,141,387.50	430,343.00	1,697,150.00	4,268,880.50
64,200.00	.....	3,554,937.50	862,643.00	963,000.00	5,380,580.50
52,750.00	.....	3,177,552.50	829,400.00	350,325.00	4,357,277.50
39,295.00	.....	1,658,245.00	1,891,179.80	99,890.00	3,649,314.80
40,420.00	.....	5,079,745.00	1,980,063.50	369,380.00	7,429,188.50
116,765.00	.....	35,337,537.50	2,801,283.00	379,455.00	38,518,275.50
141,875.00	.....	8 219,270.00	2,579,995.00	342,475.00	11,141,740.00
135,280.00	.....	5,918,630.00	5,349,035.00	246,970.00	11,514,635.00
79,440.00	.....	11,706,737.50	10,269,307.50	210,800.00	22,186,845.00
8,525.00	.....	7,979,844.00	10,651,045.50	8,525.00	18,639,414.50
57,998.50	.....	13,235,242.00	11,932,850.00	58,186.50	25,226,278.50
162,312.00	.....	9,744,645.00	14,816,776.00	165,003.00	24,726,424.00
389,649.55	.....	33,322,294.00	12,615,693.75	391,395.95	46,329,383.70
392,115.75	.....	67,372,810.00	9,176,163.75	428,151.75	76,977,125.50
385,811.00	.....	35,849,960.00	11,500,132.00	960,400.00	48,310,492.00
455,981.09	.....	3,273,960.00	13,067,968.45	1,604,770.41	17,946,698.86
232,617.42	.....	1,740,216.50	14,412,369.25	796,483.78	16,949,069.53
117,653.84	.....	5,576,512.50	18,047,807.20	191,622.04	23,815,941.74
176,542.90	.....	4,345,542.00	20,636,057.50	343,186.10	25,294,785.60
452,264.83	.....	582,383.00	21,424,636.40	1,215,686.26	23,222,705.66
374,944.14	.....	6,018,958.00	19,742,606.45	912,200.78	26,673,765.23
488,693.61	.....	1,047,031.00	22,474,415.35	1,283,408.49	24,804,854.84
571,828.54	.....	2,144,002.50	17,820,186.60	1,384,792.14	21,348,981.24
470,723.50	.....	1,282,185.00	11,305,716.00	1,312,441.00	13,900,342.00
376,498.32	.....	11,840,202.50	5,251,303.25	961,480.42	18,052,986.17
466,421.95	.....	33,011,980.00	5,023,523.45	1,134,931.70	39,170,435.15
167,521.32	.....	56,887,660.00	1,676,798.20	438,177.92	59,002,636.12
383,436.36	.....	34,716,357.50	2,109,797.00	882,430.56	37,708,585.06
390,572.93	.....	16,960,060.00	11,620,909.70	832,718.93	29,413,688.63
210,692.93	.....	35,427,217.50	2,299,502.65	617,876.98	38,344,597.13
12,019,207.92	39,926.11	865,233,236.50	383,982,904.55	28,814,558.26	1,278,030,699.31

Coinage of the Mints of the United States

[Coinage of the mint at New Orleans from its organization, 1838, to

Calendar years.	GOLD.						SILVER.
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles.	Dollars.	Dollars.
1838	.....	.....	.....	.....	.....	.....	.....
1839	.....	.....	.....	.....	$44,452.50	.....	.....
1840	.....	.....	$152,000	.....	65,500.00	.....	.....
1841	.....	$25,000	41,750	.....	18,450.00	.....	.....
1842	.....	274,000	82,000	.....	49,500.00	.....	.....
1843	.....	1,751,620	505,375	.....	920,005.00	.....	.....
1844	.....	1,187,000	1,823,000	.....	.....	.....	.....
1845	.....	475,000	205,000	.....	.....	.....	.....
1846	.....	817,800	290,000	.....	165,000.00	.....	$59,000
1847	.....	5,715,000	60,000	.....	310,000.00	.....	.....
1848	.....	358,500	.....	.....	.....	.....	.....
1849	.....	239,000	.....	.....	.....	$215,000	.....
1850	$2,820,000	575,000	.....	.....	210,000.00	14,000	40,000
1851	6,300,000	2,630,000	205,000	.....	370,000.00	290,000	.....
1852	3,800,000	180,000	.....	.....	350,000.00	140,000	.....
1853	1,420,000	510,000	.....	.....	.....	290,000	.....
1854	65,000	525,000	230,000	$72,000	382,500.00	.....	.....
1855	160,000	180,000	55,500	.....	.....	55,000	.....
1856	45,000	145,000	50,000	.....	52,750.00	.....	.....
1857	600,000	55,000	65,000	.....	85,000.00	.....	.....
1858	705,000	200,000	.....	.....	.....	.....	.....
1859	182,000	23,000	.....	.....	.....	.....	360,000
1860	132,000	111,000	.....	.....	.....	.....	515,000
1861 *a*	100,000	.....	.....	.....	.....	.....	.....
1879	46,500	15,000	.....	.....	.....	.....	2,887,000
1880	.....	92,000	.....	.....	.....	.....	5,305,000
1881	.....	83,500	.....	.....	.....	.....	5,708,000
1882	.....	108,200	.....	.....	.....	.....	6,090,000
1883	.....	8,000	.....	.....	.....	.....	8,725,000
1884	.....	.....	.....	.....	.....	.....	9,730,000
1885	.....	.....	.....	.....	.....	.....	9,185,000
1886	.....	.....	.....	.....	.....	.....	10,710,000
1887	.....	.....	.....	.....	.....	.....	11,550,000
1888	.....	213,350	.....	.....	.....	.....	12,150,000
1889	.....	.....	.....	.....	.....	.....	11,875,000
1890	.....	.....	.....	.....	.....	.....	10,701,000
1891	.....	.....	.....	.....	.....	.....	7,954,529
1892	.....	286,880	50,000	.....	.....	.....	2,744,000
1893	.....	170,000	550,000	.....	.....	.....	300,000
1894	.....	1,075,000	83,000	.....	.....	.....	1,723,000
1895	.....	980,000	.....	.....	.....	.....	450,000
1896	.....	.....	.....	.....	.....	.....	4,900,000
January 1 to June 30, 1897	.....	.....	.....	.....	.....	.....	2,980,000
Total	16,375,500	19,008,850	4,447,625	72,000	3,023,157.50	1,004,000	126,641,529

a No coinage from 1862 to 1878, inclusive.

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

its suspension, 1861, and from its reopening, 1879, to June 30, 1897.

SILVER.					TOTAL COINAGE.		TOTAL VALUE.
Half dollars.	Quarter dollars.	Dimes.	Half dimes.	Three cents.	Gold.	Silver.	
.....	.....	$40,243.40	.....	.....	.....	$40,243.40	$40,243.40
$81,488	.....	124,327.20	$54,827.50	.....	$44,452.50	260,642.70	305,095.20
427,550	$106,300	117,500.00	46,750.00	.....	217,500.00	698,100.00	915,600.00
200,500	113,000	200,750.00	40,750.00	.....	85,200.00	555,000.00	640,200.00
478,500	192,250	202,000.00	17,500.00	.....	405,500.00	890,250.00	1,295,750.00
1,134,000	242,000	15,000.00	.....	.....	3,177,000.00	1,391,000.00	4,568,000.00
1,002,500	185,000	.....	11,000.00	.....	3,010,000.00	1,198,500.00	4,208,500.00
1,047,000	.....	23,000.00	.....	.....	680,000.00	1,070,000.00	1,750,000.00
1,152,000	.....	.....	.....	.....	1,272,800.00	1,211,000.00	2,483,800.00
1,292,000	92,000	.....	.....	.....	6,085,000.00	1,384,000.00	7,469,000.00
1,590,000	.....	.....	30,000.00	.....	358,500.00	1,620,000.00	1,978,500.00
1,155,000	.....	30,000.00	7,000.00	.....	454,000.00	1,192,000.00	1,646,000.00
1,228,000	103,000	51,000.00	34,500.00	.....	3,619,000.00	1,456,500.00	5,075,500.00
201,000	22,000	40,000.00	43,000.00	$21,600	9,795,000.00	327,600.00	10,122,600.00
72,000	24,000	43,000.00	13,000.00	.....	4,470,000.00	152,000.00	4,622,000.00
664,000	333,000	110,000.00	118,000.00	.....	2,220,000.00	1,225,000.00	3,445,000.00
2,620,000	371,000	177,000.00	78,000.00	.....	1,274,500.00	3,246,000.00	4,520,500.00
1,844,000	44,000	.....	30,000.00	.....	450,500.00	1,918,000.00	2,368,500.00
1,329,000	242,000	118,000.00	55,000.00	.....	292,750.00	1,744,000.00	2,036,750.00
409,000	295,000	154,000.00	69,000.00	.....	805,000.00	927,000.00	1,732,000.00
3,647,000	130,000	29,000.00	83,000.00	.....	905,000.00	3,889,000.00	4,794,000.00
1,417,000	65,000	48,000.00	28,000.00	.....	205,000.00	1,918,000.00	2,123,000.00
645,000	97,000	4,000.00	53,000.00	.....	243,000.00	1,314,000.00	1,557,000.00
165,000	.....	.....	.....	.....	100,000.00	165,000.00	265,000.00
.....	.....	.....	.....	.....	61,500.00	2,887,000.00	2,948 500.00
.....	.....	.....	.....	.....	92,000.00	5,305,000.00	5,397,000.00
.....	.....	.....	.....	.....	83,500.00	5,708,000.00	5,791,500.00
.....	.....	.....	.....	.....	108,200.00	6,090,000.00	6,198,200.00
.....	.....	.....	.....	.....	8,000.00	8,725,000.00	8,733,000.00
.....	.....	.....	.....	.....	.....	9,730,000.00	9,730,000.00
.....	.....	.....	.....	.....	.....	9,185,000.00	9,185,000.00
.....	.....	.....	.....	.....	.....	10,710,000.00	10,710,000.00
.....	.....	.....	.....	.....	.....	11,550,000.00	11,550,000.00
.....	.....	.....	.....	.....	213,350.00	12,150,000.00	12,363,350.00
.....	.....	.....	.....	.....	.....	11,875,000.00	11,875,000.00
.....	.....	.....	.....	.....	.....	10,701,000.00	10,701,000.00
.....	17,000	454,000.00	.....	.....	.....	8,425,529.00	8,425,529.00
195,000	660,000	384,170.00	.....	.....	336,880.00	3,983,170.00	4,320,050.00
694,500	849,000	176,000.00	.....	.....	720,000.00	2,019,500.00	2,739,500.00
1,069,000	713,000	72,000.00	.....	.....	1,158,000.00	3,577,000.00	4,735,000.00
883,000	704,000	44,000.00	.....	.....	980,000.00	2,081,000.00	3,061,000.00
462,000	371,000	61,000.00	.....	.....	.....	5,794,000.00	5,794,000.00
46,000	38,000	16,600.00	.....	.....	.....	3,080,600.00	3,080,600.00
27,151,038	6,008,550	2,734,590.60	812,327.50	21,600	43,931,132.50	163,369,635.10	207,300,767.60

Coinage of the Mints of the United States from their Organization, by Calendar Years—Continued.

[Coinage of the mint at Charlotte, N. C., from its organization, 1838, to its suspension, 1861.]

Calendar years.	GOLD.			TOTAL VALUE.
	Half eagles.	Quarter eagles.	Dollars.	
1838	$64,565	$19,770.00	.....	$84,335.00
1839	117,335	45,432.50	.....	162,767.50
1840	95,140	32,095.00	.....	127,235.00
1841	107,555	25,742.50	.....	133,297.50
1842	137,400	16,842.50	.....	154,242.50
1843	221,765	65,240.00	.....	287,005.00
1844*a*	118,155	29,055.00	.....	147,210.00
1845*b*	.....	.....	.....	.....
1846	64,975	12,020.00	.....	76,995.00
1847	420,755	58,065.00	.....	478,820.00
1848	322,360	41,970.00	.....	364,330.00
1849	324,115	25,550.00	$11,634	361,299.00
1850	317,955	22,870.00	6,966	347,791.00
1851	245,880	37,307.50	41,267	324,454.50
1852	362,870	24,430.00	9,434	396,734.00
1853	327,855	.....	11,515	339,370.00
1854	196,455	18,237.50	4	214,696.50
1855	198,940	9,192.50	9,803	217,935.50
1856	142,285	19,782.50	.....	162,067.50
1857	156,800	.....	13,280	170,080.00
1858	194,280	22,640.00	.....	216,920.00
1859	159,235	.....	5,235	164,470.00
1860	74,065	18,672.50	.....	92,737.50
1861	34,395	.....	.....	34,395.00
Total	4,405,135	544,915.00	109,138	5,059,188.00

a Mint burned July 27, 1844. *b* No coinage.

Coinage of the Mints of the United States from their Organization, by Calendar Years—Continued.

[Coinage of the mint at Dahlonega, Ga., from its organization, 1838, to its suspension, 1861.]

Calendar years.	GOLD.				TOTAL VALUE.
	Half eagles.	Three dollars.	Quarter eagles.	Dollars.	
1838	$102,915	.....	.....	.....	$102,915.00
1839	94,695	.....	$34,185.00	.....	128,880.00
1840	114,480	.....	8,830.00	.....	123,310.00
1841	152,475	.....	10,410.00	.....	162,885.00
1842	298,040	.....	11,607.50	.....	309,647.50
1843	492,260	.....	90,522.50	.....	582,782.50
1844	444,910	.....	43,330.00	.....	488,240.00
1845	453,145	.....	48,650.00	.....	501,795.00
1846	401,470	.....	48,257.50	.....	449,727.50
1847	322,025	.....	39,460.00	.....	361,485.00
1848	237,325	.....	34,427.50	.....	271,752.50
1849	195,180	.....	27,362.50	$21,588	244,130.50
1850	219,750	.....	30,370.00	8,382	258,502.00
1851	313,550	.....	28,160.00	9,882	351,592.00
1852	457,260	.....	10,195.00	6,360	473,815.00
1853	448,390	.....	7,945.00	6,583	462,918.00
1854	282,065	$3,360	4,400.00	2,935	292,760.00
1855	112,160	.....	2,807.50	1,811	116,778.50
1856	98,930	.....	2,185.00	1,460	102,575.00
1857	85,230	.....	5,910.00	3,533	94,673.00
1858	76,810	.....	.....	3,477	80,287.00
1859	51,830	.....	5,610.00	4,952	62,392.00
1860	73,175	.....	.....	1,566	74,741.00
1861	7,985	.....	.....	.....	7,985.00
Total	5,536,055	3,360	494,625.00	72,529	6,106,569.00

Coinage of the Mints of the United States

[Coinage of the mint at San Francisco

Calendar years.	GOLD.						SILVER.	
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles.	Dollars.	Dollars.	Trade dollars.
1854	$2,829,360	$1,238,260	$1,340	.....	$615	$14,632	.....	.....
1855	17,593,500	90,000	305,000	$19,800	.....	.....	.....	.....
1856	23,795,000	680,000	525,500	103,500	177,800	24,600	.....	.....
1857	19,410,000	260,000	435,000	42,000	170,000	10,000	.....	.....
1858	16,934,200	118,000	93,000	.....	3,000	10,000	.....	.....
1859	12,728,900	70,000	66,100	.....	38,000	15,000	$20,000	.....
1860	10,899,000	50,000	106,000	21,000	89,000	13,000	.....	.....
1861	15,360,000	155,000	90,000	.....	60,000	.....	.....	.....
1862	17,083,460	125,000	47,500	.....	20,000	.....	.....	.....
1863	19,331,400	100,000	85,000	.....	27,000	.....	.....	.....
1864	15,873,200	25,000	19,440	.....	.....	.....	.....	.....
1865	20,850,000	167,000	138,060	.....	58,440	.....	.....	.....
1866	16,845,000	200,000	219,600	.....	97,400	.....	.....	.....
1867	18,415,000	90,000	145,000	.....	70,000	.....	.....	.....
1868	16,750,000	135,000	260,000	.....	85,000	.....	.....	.....
1869	13,735,000	64,300	155,000	.....	73,750	.....	.....	.....
1870	19,640,000	80,000	85,000	.....	40,000	3,000	.....	.....
1871	18,560,000	165,000	125,000	.....	55,000	.....	.....	.....
1872	15,600,000	173,000	182,000	.....	45,000	.....	9,000	.....
1873	20,812,000	120,000	155,000	.....	67,500	.....	700	$703,000
1874	24,280,000	100,000	80,000	.....	.....	.....	.....	2,549,000
1875	24,600,000	.....	45,000	.....	29,000	.....	.....	4,487,000
1876	31,940,000	50,000	20,000	.....	12,500	.....	.....	5,227,000
1877	34,700,000	170,000	133,500	.....	88,500	.....	.....	9,519,000
1878	34,780,000	261,000	723,500	.....	445,000	.....	9,774,000	4,162,000
1879	24,476,000	2,240,000	2,131,000	.....	108,750	.....	9,110,000	.....
1880	16,720,000	5,062,500	6,744,500	.....	.....	.....	8,900,000	.....
1881	14,540,000	9,700,000	4,845,000	.....	.....	.....	12,760,000	.....
1882	22,500,000	1,320,000	4,845,000	.....	.....	.....	9,250,000	.....
1883	23,780,000	380,000	416,000	.....	.....	.....	6,250,000	.....
1884	18,320,000	1,242,500	885,000	.....	.....	.....	3,200,000	.....
1885	13,670,000	2,280,000	6,057,500	.....	.....	.....	1,497,000	.....
1886	.....	8,260,000	16,340,000	.....	.....	.....	750,000	.....
1887	5,660,000	8,170,000	9,560,000	.....	.....	.....	1,771,000	.....
1888	17,192,000	6,487,000	1,469,500	.....	.....	.....	657,000	.....
1889	15,494,000	4,254,000	.....	.....	.....	.....	700,000	.....
1890	16,055,000	.....	.....	.....	.....	.....	8,230,373	.....
1891	25,762,500	.....	.....	.....	.....	.....	5,296,000	.....
1892	18,603,000	1,155,000	1,492,000	.....	.....	.....	1,200,000	.....
1893	19,923,500	1,413,500	1,120,000	.....	.....	.....	100,000	.....
1894	20,971,000	250,000	279,500	.....	.....	.....	1,260,000	.....
1895	22,870,000	490,000	560,000	.....	.....	.....	400,000	.....
1896	28,078,500	1,237,500	777,000	.....	.....	.....	5,000,000	.....
January 1 to June 30, 1897	10,035,000	1,500,000	155,000	.....	.....	.....	4,475,000	.....
Total	817,995,520	60,128,560	61,917,540	186,300	1,861,255	90,232	90,610,073	26,647,000

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

from its organization, 1854, to June 30, 1897.]

SILVER.					TOTAL COINAGE.		TOTAL VALUE.
Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Half dimes.	Gold.	Silver.	
.....	.....	.....	.....	.....	$4,084,207	.....	$4,084,207.00
$64,975.00	$99,100.00	.....	.....	.....	18,008,300	$164,075.00	18,172,375.00
105,500.00	71,500.00	.....	$7,000.00	.....	25,306,400	184,000.00	25,490,400.00
79,000.00	20,500.00	.....	.....	.....	20,327,000	99,500.00	20,426,500.00
238,000.00	30,250.00	.....	6,000.00	.....	17,158,200	274,250.00	17,432,450.00
283,000.00	20,000.00	.....	6,000.00	.....	12,918,000	329,000.00	13,247,000.00
236,000.00	14,000.00	.....	14,000.00	.....	11,178,000	264,000.00	11,442,000.00
469,750.00	24,000.00	.....	17,250.00	.....	15,665,000	511,000.00	16,176,000.00
676,000.00	16,750.00	.....	18,075.00	.....	17,275,960	710,825.00	17,986,785.00
458,000.00	.....	.....	15,750.00	$5,000	19,543,400	478,750.00	20,022,150.00
329,000.00	5,000.00	.....	23,000.00	4,500	15,917,640	361,500.00	16,279,140.00
337,500.00	10,250.00	.....	17,500.00	6,000	21,213,500	371,250.00	21,584,750.00
527,000.00	7,000.00	.....	13,500.00	6,000	17,362,000	553,500.00	17,915,500.00
598,000.00	12,000.00	.....	14,000.00	6,000	18,720,000	630,000.00	19,350,000.00
580,000.00	24,000.00	.....	26,000.00	14,000	17,230,000	644,000.00	17,874,000.00
328,000.00	19,000.00	.....	45,000.00	11,500	14,028,050	403,500.00	14,431,550.00
502,000.00	.....	.....	5,000.00	.....	19,848,000	507,000.00	20,355,000.00
1,089,000.00	7,725.00	.....	32,000.00	8,050	18,905,000	1,136,775.00	20,041,775.00
290,000.00	20,750.00	.....	19,000.00	41,850	16,000,000	380,600.00	16,380,600.00
116,500.00	39,000.00	.....	45,500.00	16,200	21,154,500	920,900.00	22,075,400.00
197,000.00	98,000.00	.....	24,000.00	.....	24,460,000	2,868,000.00	27,328,000.00
1,600,000.00	170,000.00	$231,000	907,000.00	.....	24,674,000	7,395,000.00	32,069,000.00
2,264,000.00	2,149,000.00	.....	1,042,000.00	.....	32,022,500	10,682,000.00	42,704,500.00
2,678,000.00	2,249,000.00	.....	234,000.00	.....	35,092,000	14,680,000.00	49,772,000.00
6,000.00	35,000.00	.....	.....	.....	36,209,500	13,977,000.00	50,186,500.00
.....	.....	.....	.....	.....	28,955,750	9,110,000.00	38,065,750.00
.....	.....	.....	.....	.....	28,527,000	8,900,000.00	37,427,000.00
.....	.....	.....	.....	.....	29,085,000	12,760,000.00	41,845,000.00
.....	.....	.....	.....	.....	28,665,000	9,250,000.00	37,915,000.00
.....	.....	.....	.....	.....	24,576,000	6,250,000.00	30,826,000.00
.....	.....	.....	56,496.90	.....	20,447,500	3,256,496.90	23,703,996.90
.....	.....	.....	4,369.00	.....	22,007,500	1,501,369.00	23,508,869.00
.....	.....	.....	20,652.40	.....	24,600,000	770,652.40	25,370,652.40
.....	.....	.....	445,445.00	.....	23,390,000	2,216,445.00	25,606,445.00
.....	304,000.00	.....	172,000.00	.....	25,148,500	1,133,000.00	26,281,500.00
.....	.....	.....	97,267.80	.....	19,748,000	797,267.80	20,545,267.80
.....	.....	.....	142,307.60	.....	16,055,000	8,372,680.60	24,427,680.60
.....	554,000.00	.....	319,611.60	.....	25,762,500	6,169,611.60	31,932,111.60
514,514.00	241,019.75	.....	99,071.00	.....	21,250,000	2,054,604.75	23,304,604.75
370,000.00	363,633.75	.....	249,140.10	.....	22,457,000	1,082,773.75	23,539,773.75
2,024,345.00	662,205.25	.....	2.40	.....	21,500,500	3,946,552.65	25,447,052.65
554,043.00	441,170.25	.....	112,000.00	.....	23,920,000	1,507,213.25	25,427,213.25
570,474.00	47,009.75	.....	57,505.60	.....	30,093,000	5,674,989.35	35,767,989.35
109,514.00	77,700.25	.....	52,284.40	.....	11,690,000	4,714,498.65	16,404,498.65
18,195,115.00	7,832,564.00	231,000	4,359,729.80	119,100	942,179,407	147,994,580.70	1,090,173,987.70

Coinage of the Mints of the United States

[Coinage of the mint at Carson City

Calendar years.	GOLD.			SILVER.	
	Double eagles.	Eagles.	Half eagles.	Dollars.	Trade dollars.
1870	$75,780	$59,080	$38,375	$12,462	.....
1871	293,740	71,850	103,850	1,376	.....
1872	593,000	55,000	84,900	3,150	.....
1873	448,200	45,430	37,080	2,300	$124,500
1874	2,301,700	167,670	105,990	.....	1,373,200
1875	2,223,020	77,150	59,140	.....	1,573,700
1876	2,768,820	46,960	34,435	.....	509,000
1877	851,300	33,320	43,400	.....	534,000
1878	263,600	32,440	45,270	2,212,000	97,000
1879	214,160	17,620	86,405	756,000	.....
1880	.....	111,900	255,085	591,000	.....
1881	.....	240,150	69,430	296,000	.....
1882	782,800	67,640	414,085	1,133,000	.....
1883	1,199,240	120,000	64,790	1,204,000	.....
1884	1,622,780	99,250	82,010	1,136,000	.....
1885	189,000	.....	.....	228,000	.....
1886 *a*	.....	.....	.....	.....	.....
1887 *a*	.....	.....	.....	.....	.....
1888 *a*	.....	.....	.....	.....	.....
1889 *b*	618,900	.....	.....	350,000	.....
1890	1,824,180	175,000	269,000	2,309,041	.....
1891	100,000	1,037,320	1,040,000	1,618,000	.....
1892	545,300	400,000	414,840	1,352,000	.....
1893 *c*	368,040	140,000	300,000	677,000	.....
Total	17,283,560	2,997,780	3,548,085	13,881,329	4,211,400

a Coinage suspended. *b* Operations resumed October 1, 1889.

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

from its organization, 1870, to June 30, 1893.]

SILVER.				TOTAL COINAGE.		TOTAL VALUE.
Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Gold.	Silver.	
$27,308.50	$2,085.00	.....	.....	$173,235	$41,855.50	$215,090.50
69,975.00	2,722.50	.....	$2,010.00	469,440	76,083.50	545,523.50
136,000.00	2,275.00	.....	2,400.00	732,900	143,825.00	876,725.00
168,530.00	4,115.50	.....	3,119.10	530,710	302,564.60	833,274.60
29,500.00	.....	.....	1,081.70	2,575,360	1,403,781.70	3,979,141.70
504,000.00	35,000.00	$26,658	464,500.00	2,359,310	2,603,858.00	4,963,168.00
978,000.00	1,236,000.00	2,000	827,000.00	2,850,215	3,552,000.00	6,402,215.00
710,000.00	1,048,000.00	.....	770,000.00	928,020	3,062,000.00	3,990,020.00
31,000.00	249,000.00	.....	20,000.00	341,310	2,609,000.00	2,950,310.00
.....	.....	.....	.....	318,185	756,000.00	1,074,185.00
.....	.....	.....	.....	366,985	591,000.00	957,985.00
.....	.....	.....	.....	309,580	296,000.00	605,580.00
.....	.....	.....	.....	1,264,525	1,133,000.00	2,397,525.00
.....	.....	.....	.....	1,384,030	1,204,000.00	2,588,030.00
.....	.....	.....	.....	1,804,040	1,136,000.00	2,940,040.00
.....	.....	.....	.....	189,000	228,000.00	417,000.00
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	618,900	350,000.00	968,900.00
.....	.....	.....	.....	2,268,180	2,309,041.00	4,577,221.00
.....	.....	.....	.....	2,177,320	1,618,000.00	3,795,320.00
.....	.....	.....	.....	1,360,140	1,352,000.00	2,712,140.00
.....	.....	.....	.....	808,040	677,000.00	1,485,040.00
2,654,313.50	2,579,198.00	28,658	2,090,110.80	23,829,425	25,445,009.30	49,274,434.30

c Coinage suspended from May 23, 1893.

Coinage of the Mints of the United States

RECAPITULATION.

Calendar years.	GOLD COINAGE.					
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles.	Dollars.
1793–1795		$27,950	$43,535			
1796		60,800	16,995		$165.00	
1797		91,770	32,030		4,390.00	
1798		79,740	124,335		1,535.00	
1799		174,830	37,255		1,200.00	
1800		259,650	58,110			
1801		292,540	130,030			
1802		150,900	265,880		6,530.00	
1803		89,790	167,530		1,057.50	
1804		97,950	152,375		8,317.50	
1805			165,915		4,452.50	
1806			320,465		4,040.00	
1807			420,465		17,030.00	
1808			277,890		6,775.00	
1809			169,375			
1810			501,435			
1811			497,905			
1812			290,435			
1813			477,140			
1814			77,270			
1815			3,175			
1816						
1817						
1818			242,940			
1819			258,615			
1820			1,319,030			
1821			173,205		16,120.00	
1822			88,980			
1823			72,425			
1824			86,700		6,500.00	
1825			145,300		11,085.00	
1826			90,345		1,900.00	
1827			124,565		7,000.00	
1828			140,145			
1829			287,210		8,507.50	
1830			631,755		11,350.00	
1831			702,970		11,300.00	
1832			787,435		11,000.00	
1833			968,150		10,400.00	
1834			3,660,845		293,425.00	
1835			1,857,670		328,505.00	
1836			2,765,735		1,369,965.00	
1837			1,035,605		112,700.00	
1838		72,000	1,600,420		137,345.00	
1839		382,480	802,745		191,622.50	
1840		473,380	1,048,530		153,572.50	
1841		656,310	380,945		54,602.50	
1842		1,089,070	655,330		85,007.50	
1843		2,506,240	4,275,425		1,327,132.50	
1844		1,250,610	4,087,715		89,345.00	
1845		736,530	2,743,640		276,277.50	
Carried forward		8,492,540	35,263,920		4,570,155.00	

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

RECAPITULATION.

SILVER COINAGE.							
Trade dollars.	Dollars.	Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Half dimes.	Three cents.
.....	$204,791	$161,572.00	.....	.....	.....	$4,320.80	.....
.....	72,920	.....	$1,473.50	.....	$2,213.50	511.50	.....
.....	7,776	1,959.00	63.00	.....	2,526.10	2,226.35	.....
.....	327,536	.....	.....	.....	2,755.00	.....	.....
.....	423,515	.....	.....	.....	.....	.....	.....
.....	220,920	.....	.....	.....	2,176.60	1,200.00	.....
.....	54,454	15,144.50	.....	.....	3,464.00	1,605.50	.....
.....	41,650	14,945.00	.....	.....	1,097.50	650.50	.....
.....	66,064	15,857.50	.....	.....	3,304.00	1,892.50	.....
.....	19,570	78,259.50	1,684.50	.....	826.50	.....	.....
.....	321	105,861.00	30,348.50	.....	12,078.00	780.00	.....
.....	.....	419,788.00	51,531.00	.....	.....	.....	.....
.....	.....	525,788.00	55,160.75	.....	16,500.00	.....	.....
.....	.....	684,300.00	.....	.....	.....	.....	.....
.....	.....	702,905.00	.....	.....	4,471.00	.....	.....
.....	.....	638,138.00	.....	.....	635.50	.....	.....
.....	.....	601,822.00	.....	.....	6,518.00	.....	.....
.....	.....	814,029.50	.....	.....	.....	.....	.....
.....	.....	620,951.50	.....	.....	.....	.....	.....
.....	.....	519,537.50	.....	.....	42,150.00	.....	.....
.....	.....	.....	17,308.00	.....	.....	.....	.....
.....	.....	23,575.00	5,000.75	.....	.....	.....	.....
.....	.....	607,783.50	.....	.....	.....	.....	.....
.....	.....	980,161.00	90,293.50	.....	.....	.....	.....
.....	.....	1,104,000.00	36,000.00	.....	.....	.....	.....
.....	.....	375,561.00	31,861.00	.....	94,258.70	.....	.....
.....	.....	652,898.50	54,212.75	.....	118,651.20	.....	.....
.....	.....	779,786.50	16,020.00	.....	10,000.00	.....	.....
.....	.....	847,100.00	4,450.00	.....	44,000.00	.....	.....
.....	.....	1,752,477.00	.....	.....	.....	.....	.....
.....	.....	1,471,583.00	42,000.00	.....	51,060.00	.....	.....
.....	.....	2,002,000.00	.....	.....	.....	.....	.....
.....	.....	2,746,700.00	1,000.00	.....	121,500.00	.....	.....
.....	.....	1,537,600.00	25,500.00	.....	12,500.00	.....	.....
.....	.....	1,856,078.00	.....	.....	77,000.00	61,500.00	.....
.....	.....	2,382,400.00	.....	.....	51,000.00	62,000.00	.....
.....	.....	2,936,830.00	99,500.00	.....	77,135.00	62,135.00	.....
.....	.....	2,398,500.00	80,000.00	.....	52,250.00	48,250.00	.....
.....	.....	2,603,000.00	39,000.00	.....	48,500.00	68,500.00	.....
.....	.....	3,206,002.00	71,500.00	.....	63,500.00	74,000.00	.....
.....	.....	2,676,003.00	488,000.00	.....	141,000.00	138,000.00	.....
.....	1,000	3,273,100.00	118,000.00	.....	119,000.00	95,000.00	.....
.....	.....	1,814,910.00	63,100.00	.....	104,200.00	113,800.00	.....
.....	.....	1,773,000.00	208,000.00	.....	239,493.40	112,750.00	.....
.....	300	1,748,768.00	122,786.50	.....	229,638.70	108,285.00	.....
.....	61,005	1,145,054.00	153,331.75	.....	253,358.00	113,954.25	.....
.....	173,000	355,500.00	143,000.00	.....	363,000.00	98,250.00	.....
.....	184,618	1,484,882.00	214,250.00	.....	390,750.00	58,250.00	.....
.....	165,100	3,056,000.00	403,400.00	.....	152,000.00	58,250.00	.....
.....	20,000	1,885,500.00	290,300.00	.....	7,250.00	32,500.00	.....
.....	24,500	1,341,500.00	230,500.00	.....	198,500.00	78,200.00	.....
.....	2,069,040	56,739,200.50	3,188,575.50	.....	3,120,200.10	1,396,901.40	.....

Coinage of the Mints of the United States

RECAPITULATION—Continued.

Calendar years.	GOLD COINAGE.					
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles.	Dollars.
Brought forward	.....	$8,492,54	$35,263,920	.....	$4,570,155.00	.....
1846	.....	1,018,7[illegible]	[illegible],736,155	.....	279,272.50	.....
1847	.....	14,337,580	5,382,685	.....	482,060.00	.....
1848	.....	1,813,340	1,863,560	.....	98,612.50	.....
1849	.....	6,775,180	1,184,645	.....	111,147.50	$936,789
1850	$26,225,220	3,489,510	860,160	.....	895,547.50	511,301
1851	48,043,100	4,393,280	2,651,955	.....	3,867,337.50	3,658,820
1852	44,860,520	2,811,060	3,689,635	.....	3,283,827.50	2,201,145
1853	26,646,520	2,522,530	2,305,095	.....	3,519,615.00	4,384,149
1854	18,052,340	2,305,760	1,513,235	$491,214	1,896,397.50	1,657,016
1855	25,046,820	1,487,010	1,257,090	171,465	600,700.00	824,883
1856	30,437,560	1,429,900	1,806,665	181,530	1,213,117.50	1,788,996
1857	28,797,500	481,060	1,232,970	104,673	796,235.00	801,602
1858	21,873,480	343,210	439,770	6,399	144,082.50	131,472
1859	13,782,840	253,930	361,235	46,914	142,220.00	193,431
1860	22,584,400	278,830	352,365	42,465	164,360.00	51,234
1861	74,989,060	1,287,330	3,332,130	18,216	3,241,295.00	527,499
1862	18,926,120	234,950	69,825	17,355	300,882.50	1,326,865
1863	22,187,200	112,480	97,360	15,117	27,075.00	6,250
1864	19,958,900	60,800	40,540	8,040	7,185.00	5,959
1865	27,874,000	207,050	144,535	3,495	62,302.50	3,725
1866	30,820,500	237,800	253,200	12,090	105,175.00	7,180
1867	23,436,300	121,400	179,600	7,950	78,125.00	5,250
1868	18,722,000	241,550	288,625	14,625	94,062.50	10,525
1869	17,238,100	82,850	163,925	7,575	84,612.50	5,925
1870	22,819,480	164,430	143,550	10,605	51,387.50	9,335
1871	20,456,740	254,650	245,000	3,990	68,375.00	3,930
1872	21,230,600	244,500	275,350	6,090	52,575.00	3,530
1873	55,456,700	173,680	754,605	75	512,562.50	125,125
1874	33,917,700	799,270	203,530	125,460	9,850.00	198,820
1875	32,737,820	78,350	105,240	60	30,050.00	420
1876	46,386,920	104,280	61,820	135	23,052.50	3,245
1877	43,504,700	211,490	182,660	4,464	92,630.00	3,920
1878	45,916,500	1,031,440	1,427,470	246,972	1,160,650.00	3,020
1879	28,889,260	6,120,320	3,727,155	9,090	331,225.00	3,030
1880	17,749,120	21,715,160	22,831,765	3,108	7,490.00	1,636
1881	14,585,200	48,796,250	33,458,430	1,650	1,700.00	7,660
1882	23,295,400	24,740,640	17,831,885	4,620	10,100.00	5,040
1883	24,980,040	2,595,400	1,647,990	2,820	4,900.00	10,840
1884	19,944,200	2,110,800	1,922,250	3,318	4,982.50	6,206
1885	13,875,560	4,815,270	9,065,030	2,730	2,217.50	12,205
1886	22,120	10,621,600	18,282,160	3,426	10,220.00	6,016
1887	5,662,420	8,706,800	9,560,435	18,480	15,705.00	8,543
1888	21,717,320	8,030,310	1,560,980	15,873	40,245.00	16,080
1889	16,995,120	4,298,850	37,825	7,287	44,120.00	30,729
1890	19,399,080	755,430	290,640	.....	22,032.50	.....
1891	25,891,340	1,956,000	1,347,065	.....	27,600.00	.....
1892	19,238,760	9,817,400	5,724,700	.....	6,362.50	.....
1893	27,178,320	20,132,450	9,610,985	.....	75,265.00	.....
1894	48,350,800	26,032,780	5,152,275	.....	10,305.00	.....
1895	45,163,120	7,148,260	7,289,680	.....	15,297.50	.....
1896	43,931,760	2,000,980	1,072,315	.....	48,005.00	.....
January 1 to June 30, 1897	37,699,460	6,304,810	3,086,375	.....	26,572 50	.....
Total	1,337,498,040	274,581,280	224,370,045	1,619,376	28,770,880.00	19,499,337

a Includes $475,000 in Columbian coins. *b* Includes $2,026,052.50 in Columbian coins.

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

RECAPITULATION—Continued.

SILVER COINAGE.							
Trade dollars.	Dollars.	Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Half dimes.	Three cents.
.....	$2,069,040	$56,739,200.50	$3,188,575.50	.....	$3,120,200.10	$1,396,901.40	.....
.....	169,600	2,257,000.00	127,500.00	.....	3,130.00	1,350.00	.....
.....	140,750	1,870,000.00	275,500.00	.....	24,500.00	63,700.00	.....
.....	15,000	1,880,000.00	36,500.00	.....	45,150.00	63,400.00	.....
.....	62,600	1,781,000.00	85,000.00	.....	113,900.00	72,450.00	.....
.....	47,500	1,341,500.00	150,700.00	.....	244,150.00	82,250.00	.....
.....	1,300	301,375.00	62,000.00	.....	142,650.00	82,050.00	$185,022.00
.....	1,100	110,565.00	68,265.00	.....	196,550.00	63,025.00	559,905.00
.....	46,110	2,430,354.00	4,146,555.00	.....	1,327,301.00	785,251.00	342,000.00
.....	33,140	4,111,000.00	3,466,000.00	.....	624,000.00	365,000.00	20,130.00
.....	26,000	2,288,725.00	857,350.00	.....	207,500.00	117,500.00	4,170.00
.....	63,500	1,903,500.00	2,129,500.00	.....	703,000.00	299,000.00	43,740.00
.....	94,000	1,482,000.00	2,726,500.00	.....	712,000.00	433,000.00	31,260.00
.....	.....	5,998,000.00	2,002,250.00	.....	189,000.00	258,000.00	48,120.00
.....	636,500	2,074,000.00	421,000.00	.....	97,000.00	45,000.00	10,950.00
.....	733,930	1,032,850.00	312,350.00	.....	78,700.00	92,950.00	8,610.00
.....	78,500	2,078,950.00	1,237,650.00	.....	209,650.00	164,050.00	14,940.00
.....	12,090	802,175.00	249,887.50	.....	102,830.00	74,627.50	10,906.50
.....	27,660	709,830.00	48,015.00	.....	17,196.00	5,923.00	643.80
.....	31,170	518,785.00	28,517.50	.....	26,907.00	4,523.50	14.10
.....	47,000	593,450.00	25,075.00	.....	18,550.00	6,675.00	255.00
.....	49,625	899,812.50	11,381.25	.....	14,372.50	6,536.25	681.75
.....	60,325	810,162.50	17,156.25	.....	14,662.50	6,431.25	138.75
.....	182,700	769,100.00	31,500.00	.....	72,625.00	18,295.00	123.00
.....	424,300	725,950.00	23,150.00	.....	70,660.00	21,930.00	153.00
.....	445,462	829,758.50	23,935.00	.....	52,150.00	26,830.00	120.00
.....	1,117,136	1,741,655.00	53,255.50	.....	109,371.00	82,493.00	127.80
.....	1,118,600	866,775.00	68,762.50	.....	261,045.00	189,247.50	58.50
$1,225,000	296,600	1,593,780.00	414,190.50	.....	443,329.10	51,830.00	18.00
4,910,000	.....	1,406,650.00	215,975.00	.....	319,151.70	.....	.....
6,279,600	.....	5,117,750.00	1,278,375.00	$265.598	2,406,570.00	.....	.....
6,192,150	.....	7,451,575.00	7,839,287.50	5,180	3,015,115.00	.....	.....
13,092,710	.....	7,540,255.00	6,024,927.50	102	1,735,051.00	.....	.....
4,259,900	22,495,550	726,200.00	849,200.00	120	187,880.00	.....	.....
1,541	27,560,100	2,950.00	3,675.00	.....	1,510.00	.....	.....
1,987	27,397,355	4,877.50	3,738.75	.....	3,735.50	.....	.....
960	27,927,975	5,487.50	3,243.75	.....	2,497.50	.....	.....
1,097	27,574,100	2,750.00	4,075.00	.....	391,110.00	.....	.....
979	28,470,039	4,519.50	3,859.75	.....	767,571.20	.....	.....
.....	28,136,875	2,637.50	2,218.75	.....	393,134.90	.....	.....
.....	28,697,767	3,065.00	3,632.50	.....	257,711.70	.....	.....
.....	31,423,886	2,943.00	1,471.50	.....	658,409.40	.....	.....
.....	33,611,710	2,855.00	2,677.50	.....	1,573,838.90	.....	.....
.....	31,990,833	6,416.50	306,708.25	.....	721,648.70	.....	.....
.....	34,651,811	6,355.50	3,177.75	.....	835,338.90	.....	.....
.....	38,043,004	6,295.00	20,147.50	.....	1,133,461.70	.....	.....
.....	23,562,735	100,300.00	1,551,150.00	.....	2,304,671.60	.....	.....
.....	6,333,245	*a* 1,652,136.50	2,960,331.00	.....	1,695,365.50	.....	.....
.....	1,455,792	*b* 4,003,948.50	*c* 2,583,837.50	.....	759,219.30	.....	.....
.....	3,093,972	3,667,831.00	2,233,448.25	.....	205,099.60	.....	.....
.....	862,880	2,354,652.00	2,255,390.25	.....	225,088.00	.....	.....
.....	19,876,762	1,507,855.00	1,386,700.25	.....	318,581.80	.....	.....
.....	8,827,351	412,689.50	579,788.00	.....	274,772.80	.....	.....
35,965,924	460,024,980	136,534,247.50	52,405,057.75	271,000	29,428,613.90	4,880,219.40	1,282,087.20

c Includes $10,005.75 in Columbian coins.

COINAGE OF THE MINTS OF THE UNITED STATES

RECAPITULATION—Continued.

Calendar years.	MINOR COINAGE.		
	Five cents.	Three cents.	Two cents.
1793-1795			
1796			
1797			
1798			
1799			
1800			
1801			
1802			
1803			
1804			
1805			
1806			
1807			
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1831			
1832			
1833			
1834			
1835			
1836			
1837			
1838			
1839			
1840			
1841			
1842			
1843			
1844			
1845			
1846			
Carried forward			

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

RECAPITULATION—Continued.

MINOR COINAGE.		TOTAL COINAGE.			TOTAL VALUE.
Cents.	Half cents.	Gold.	Silver.	Minor.	
$10,660.33	$712.67	$71,485.00	$370,683.80	$11,373.00	$453,541.80
9,747.00	577.40	77,960.00	77,118.50	10,324.40	165,402.90
8,975.10	535.24	128,190.00	14,550.45	9,510.34	152,250.79
9,797.00	.....	205,610.00	330,291.00	9,797.00	545,698.00
9,045.85	60.83	213,285.00	423,515.00	9,106.68	645,906.68
28,221.75	1,057.65	317,760.00	224,296.00	29,279.40	571,335.40
13,628.37	.....	422,570.00	74,758.00	13,628.37	510,956.37
34,351.00	71.83	423,310.00	58,343.00	34,422.83	516,075.83
24,713.53	489.50	258,377.50	87,118.00	25,203.03	370,698.53
7,568.38	5,276.56	258,642.50	100,340.50	12,844.94	371,827.94
9,411.16	4,072.32	170,367.50	149,388.50	13,483.48	333,239.48
3,480.00	1,780.00	324,505.00	471,319.00	5,260.00	801,084.00
7,272.21	2,380.00	437,495.00	597,448.75	9,652.21	1,044,595.96
11,090.00	2,000.00	284,665.00	684,300.00	13,090.00	982,055.00
2,228.67	5,772.86	169,375.00	707,376.00	8,001.53	884,752.53
14,585.00	1,075.00	501,435.00	638,773.50	15,660.00	1,155,868.50
2,180.25	315.70	497,905.00	608,340.00	2,495.95	1,108,740.95
10,755.00	.....	290,435.00	814,029.50	10,755.00	1,115,219.50
4,180.00	.....	477,140.00	620,951.50	4,180.00	1,102,271.50
3,578.30	.....	77,270.00	561,687.50	3,578.30	642,535.80
.....	.....	3,175.00	17,308.00	.....	20,483.00
28,209.82	.....	.....	28,575.75	28,209.82	56,785.57
39,484.00	.....	.....	607,783.50	39,484.00	647,267.50
31,670.00	.....	242,940.00	1,070,454.50	31,670.00	1,345,064.50
26,710.00	.....	258,615.00	1,140,000.00	26,710.00	1,425,325.00
44,075.50	.....	1,319,030.00	501,680.70	44,075.50	1,864,786.20
3,890.00	.....	189,325.00	825,762.45	3,890.00	1,018,977.45
20,723.39	.....	88,980.00	805,806.50	20,723.39	915,509.89
.....	.....	72,425.00	895,550.00	.....	967,975.00
12,620.00	.....	93,200.00	1,752,477.00	12,620.00	1,858,297.00
14,611.00	315.00	156,385.00	1,564,583.00	14,926.00	1,735,894.00
15,174.25	1,170.00	92,245.00	2,002,090.00	16,344.25	2,110,679.25
23,577.32	.....	131,565.00	2,869,200.00	23,577.32	3,024,342.32
22,606.24	3,030.00	140,145.00	1,575,600.00	25,636.24	1,741,381.24
14,145.00	2,435.00	295,717.50	1,994,578.00	16,580.00	2,306,875.50
17,115.00	.....	643,105.00	2,495,400.00	17,115.00	3,155,620.00
33,592.60	11.00	714,270.00	3,175,600.00	33,603.60	3,923,473.60
23,620.00	.....	798,435.00	2,579,000.00	23,620.00	3,401,055.00
27,390.00	770.00	978,550.00	2,759,000.00	28,160.00	3,765,710.00
18,551.00	600.00	3,954,270.00	3,415,002.00	19,151.00	7,388,423.00
38,784.00	705.00	2,186,175.00	3,443,003.00	39,489.00	5,668,667.00
21,110.00	1,990.00	4,135,700.00	3,606,100.00	23,100.00	7,764,900.00
55,583.00	.....	1,148,305.00	2,096,010.00	55,583.00	3,299,898.00
63,702.00	.....	1,809,765.00	2,333,243.40	63,702.00	4,206,710.40
31,286.61	.....	1,376,847.50	2,209,778.20	31,286.61	3,617,912.31
24,627.00	.....	1,675,482.50	1,726,703.00	24,627.00	3,426,812.50
15,973.67	.....	1,091,857.50	1,132,750.00	15,973.67	2,240,581.17
23,833.90	.....	1,829,407.50	2,332,750.00	23,833.90	4,185,991.40
24,283.20	.....	8,108,797.50	3,834,750.00	24,283.20	11,967,830.70
23,987.52	.....	5,427,670.00	2,235,550.00	23,987.52	7,687,207.52
38,948.04	.....	3,756,447.50	1,873,200.00	38,948.04	5,668,595.54
41,208.00	.....	4,034,177.50	2,558,580.00	41,208.00	6,633,965.50
1,046,560.96	37,203.56	52,360,792.50	69,072,497.50	1,083,764.52	122,517,054.52

COINAGE OF THE MINTS OF THE UNITED STATES

RECAPITULATION—Continued.

Calendar years.	MINOR COINAGE.		
	Five cents.	Three cents.	Two cents.
Brought forward			
1847			
1848			
1849			
1850			
1851			
1852			
1853			
1854			
1855			
1856			
1857			
1858			
1859			
1860			
1861			
1862			
1863			
1864			$396,950.00
1865		$341,460.00	272,800.00
1866	$737,125.00	144,030.00	63,540.00
1867	1,545,475.00	117,450.00	58,775.00
1868	1,440,850.00	97,560.00	56,075.00
1869	819,750.00	48,120.00	30,930.00
1870	240,300.00	40,050.00	17,225.00
1871	28,050.00	18,120.00	14,425.00
1872	301,800.00	25,860.00	1,300.00
1873	227,500.00	35,190.00	
1874	176,900.00	23,700.00	
1875	104,850.00	6,840.00	
1876	126,500.00	4,860.00	
1877			
1878	117.50	70.50	
1879	1,455.00	1,236.00	
1880	997.75	748.65	
1881	3,618.75	32,417.25	
1882	573,830.00	759.00	
1883	1,148,471.05	318.27	
1884	563,697.10	169.26	
1885	73,824.50	143.70	
1886	166,514.50	128.70	
1887	763,182.60	238.83	
1888	536,024.15	1,232.49	
1889	794,068.05	646.83	
1890	812,963.60		
1891	841,717.50		
1892	584,982.10		
1893	668,509.75		
1894	270,656.60		
1895	498,994.20		
1896	442,146.00		
January 1 to June 30, 1897	407,184.05		
Total	14,902,054.75	941,349.48	912,020.00

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

RECAPITULATION—Continued.

MINOR COINAGE.		TOTAL COINAGE.			TOTAL VALUE.
Cents.	Half cents.	Gold.	Silver.	Minor.	
$1,046,560.96	$37,203.56	$52,360,792.50	$69,072,497.50	$1,083,764.52	$122,517,054.52
61,836.69	.....	20,202,325.00	2,374,450.00	61,836.69	22,638,611.69
64,157.99	.....	3,775,512.50	2,040,050.00	64,157.99	5,879,720.49
41,785.00	199.32	9,007,761.50	2,114,950.00	41,984.32	11,164,695.82
44,268.44	199.06	31,981,738.50	1,866,100.00	44,467.50	33,892,306.00
98,897.07	738.36	62,614,492.50	774,397.00	99,635.43	63,488,524.93
50,630.94	.....	56,846,187.50	999,410.00	50,630.94	57,896,228.44
66,411.31	648.47	39,377,909.00	9,077,571.00	67,059.78	48,522,539.78
42,361.56	276.79	25,915,962.50	8,619,270.00	42,638.35	34,577,870.85
15,748.29	282.50	29,387,968.00	3,501,245.00	16,030.79	32,905,243.79
26,904.63	202.15	36,857,768.50	5,142,240.00	27,106.78	42,027,115.28
177,834.56	175.90	32,214,040.00	5,478,760.00	178,010.46	37,870,810.46
246,000.00	.....	22,938,413.50	8,495,370.00	246,000.00	31,679,783.50
364,000.00	.....	14,780,570.00	3,284,450.00	364,000.00	18,429,020.00
205,660.00	.....	23,473,654.00	2,259,390.00	205,660.00	25,938,704.00
101,000.00	.....	83,395,530.00	3,783,740.00	101,000.00	87,280,270.00
280,750.00	.....	20,875,997.50	1,252,516.50	280,750.00	22,409,264.00
498,400.00	.....	22,445,482.00	809,267.80	498,400.00	23,753,149.80
529,737.14	.....	20,081,415.00	609,917.10	926,687.14	21,618,019.24
354,292.86	.....	28,295,107.50	691,005.00	968,552.86	29,954,665.36
98,265.00	.....	31,435,945.00	982,409.25	1,042,960.00	33,461,314.25
98,210.00	.....	23,828,625.00	908,876.25	1,819,910.00	26,557,411.25
102,665.00	.....	19,371,387.50	1,074,343.00	1,697,150.00	22,142,880.50
64,200.00	.....	17,582,987.50	1,266,143.00	963,000.00	19,812,130.50
52,750.00	....	23,198,787.50	1,378,255.50	350,325.00	24,927,368.00
39,295.00	.....	21,032,685.00	3,104,038.30	99,890.00	24,236,613.30
40,420.00	.....	21,812,645.00	2,504,488.50	369,380.00	24,686,513.50
116,765.00	.....	57,022,747.50	4,024,747.60	379,455.00	61,426,950.10
141,875.00	.....	35,254,630.00	6,851,776.70	342,475.00	42,448,881.70
135,280.00	.....	32,951,940.00	15,347,893.00	246,970.00	48,546,803.00
79,440.00	.....	46,579,452.50	24,503,307.50	210,800.00	71,293,560.00
8,525.00	.....	43,999,864.00	28,393,045.50	8,525.00	72,401,434.50
57,998.50	.....	49,786,052.00	28,518,850.00	58,186.50	78,363,088.50
162,312.00	.....	39,080,080.00	27,569,776.00	165,003.00	66,814,859.00
389,649.55	.....	62,308,279.00	27,411,693.75	391,395.95	90,111,368.70
392,115.75	.....	96,850,890.00	27,940,163.75	428,151.75	125,219,205.50
385,811.00	.....	65,887,685.00	27,973,132.00	960,400.00	94,821,217.00
455,981.09	.....	29,241,990.00	29,246,968.45	1,604,770.41	60,093,728.86
232,617.42	.....	23,991,756.50	28,534,866.15	796,483.78	53,323,106.43
117,653.84	.....	27,773,012.50	28,962,176.20	191,622.04	56,926,810.74
176,542.90	.....	28,945,542.00	32,086,709.90	343,186.10	61,375,438.00
452,264.83	.....	23,972,383.00	35,191,081.40	1,215,686.26	60,379,150.66
374,944.14	.....	31,380,808.00	33,025,606.45	912,200.78	65,318,615.23
488,693.61	.....	21,413,931.00	35,496,683.15	1,283,408.49	58,194,022.64
571,828.54	.....	20,467,182.50	39,202,908.20	1,384,792.14	61,054,882.84
470,723.50	.....	29,222,005.00	27,518,856.60	1,312,441.00	58,053,302.60
376,498.32	.....	34,787,222.50	12,641,078.00	961,480.42	48,389,780.92
466,421.95	.....	56,997,020.00	8,802,797.30	1,134,931.70	66,934,749.00
167,521.32	.....	79,546,160.00	9,200,350.85	438,177.92	89,184,688.77
383,436.36	.....	59,616,357.50	5,698,010.25	882,430.56	66,196,798.31
390,572.93	.....	47,053,060.00	23,089,899.15	832,718.93	70,975,677.98
210,692.93	.....	47,117,217.50	10,094,601.30	617,876.98	57,829,695.78
12,019,207.92	39,926.11	1,886,338,958.00	720,792,129.85	28,814,558.26	2,635,945,646.01

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